

FIG. 1

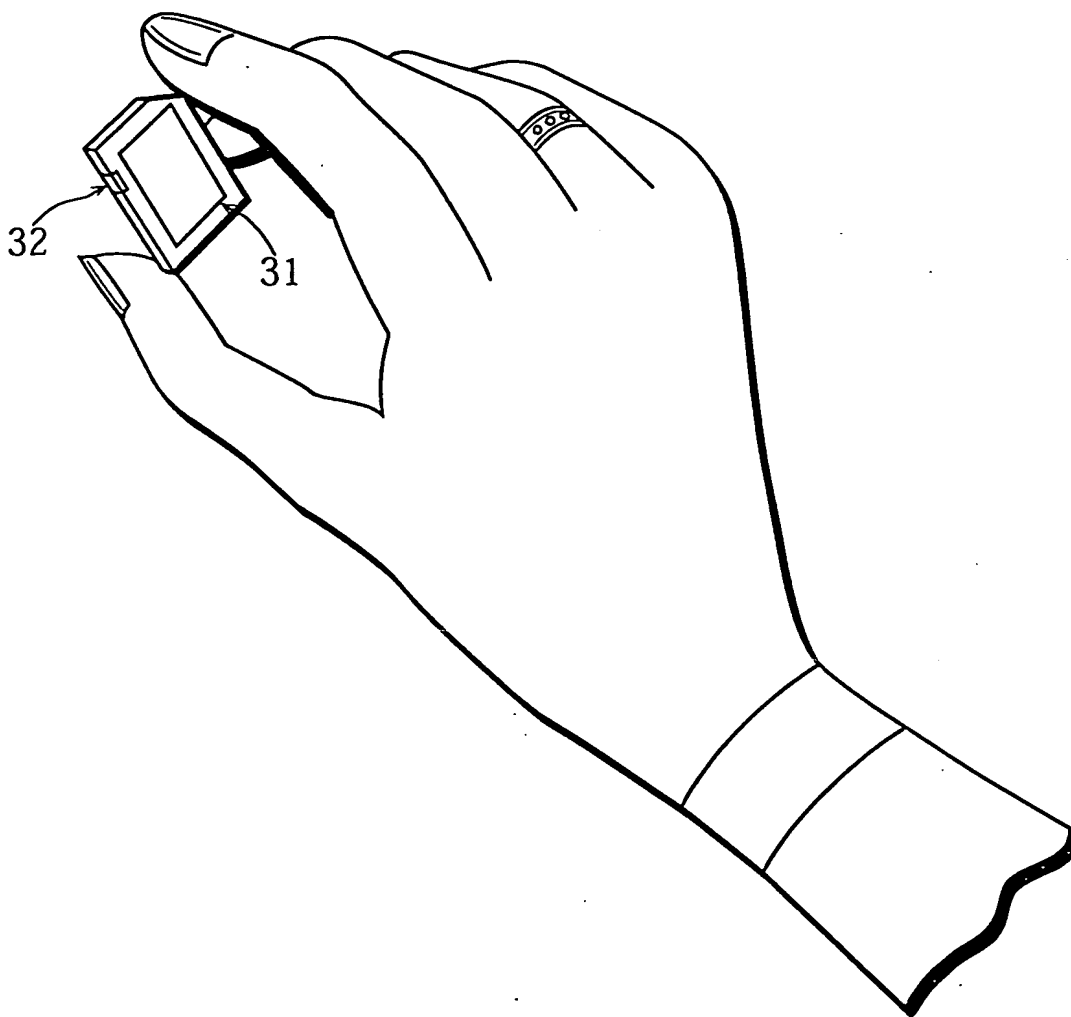


FIG. 2

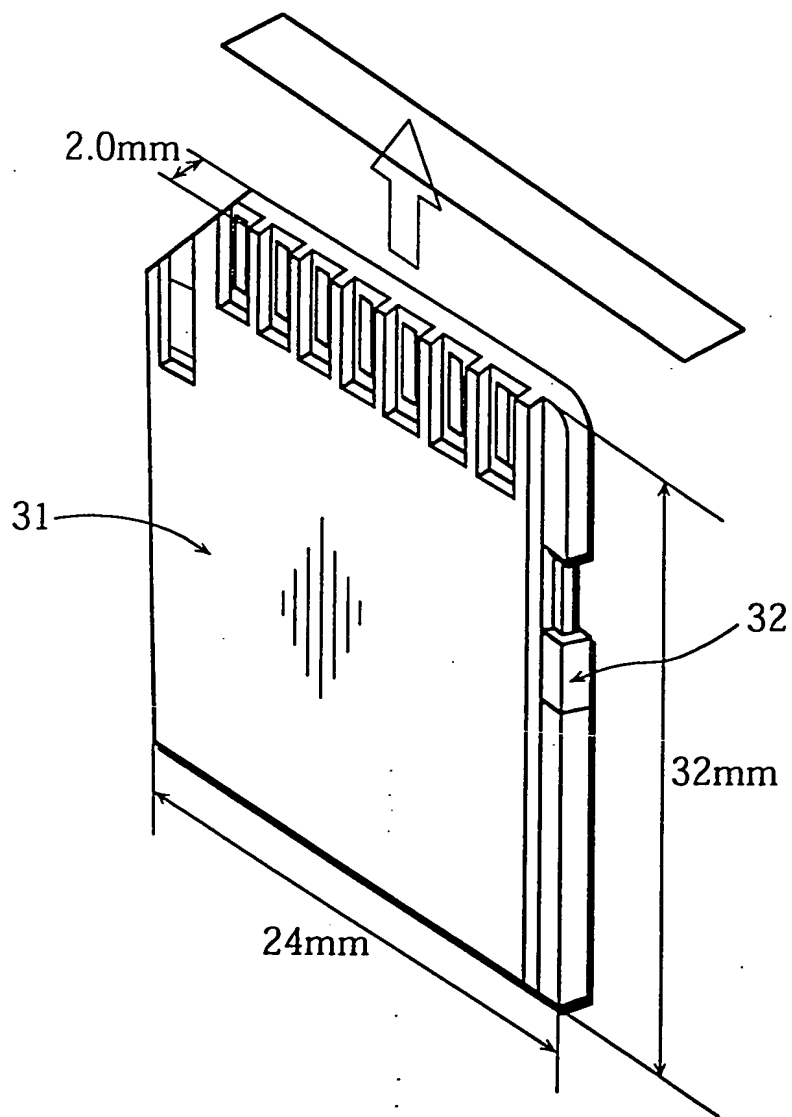


FIG. 3

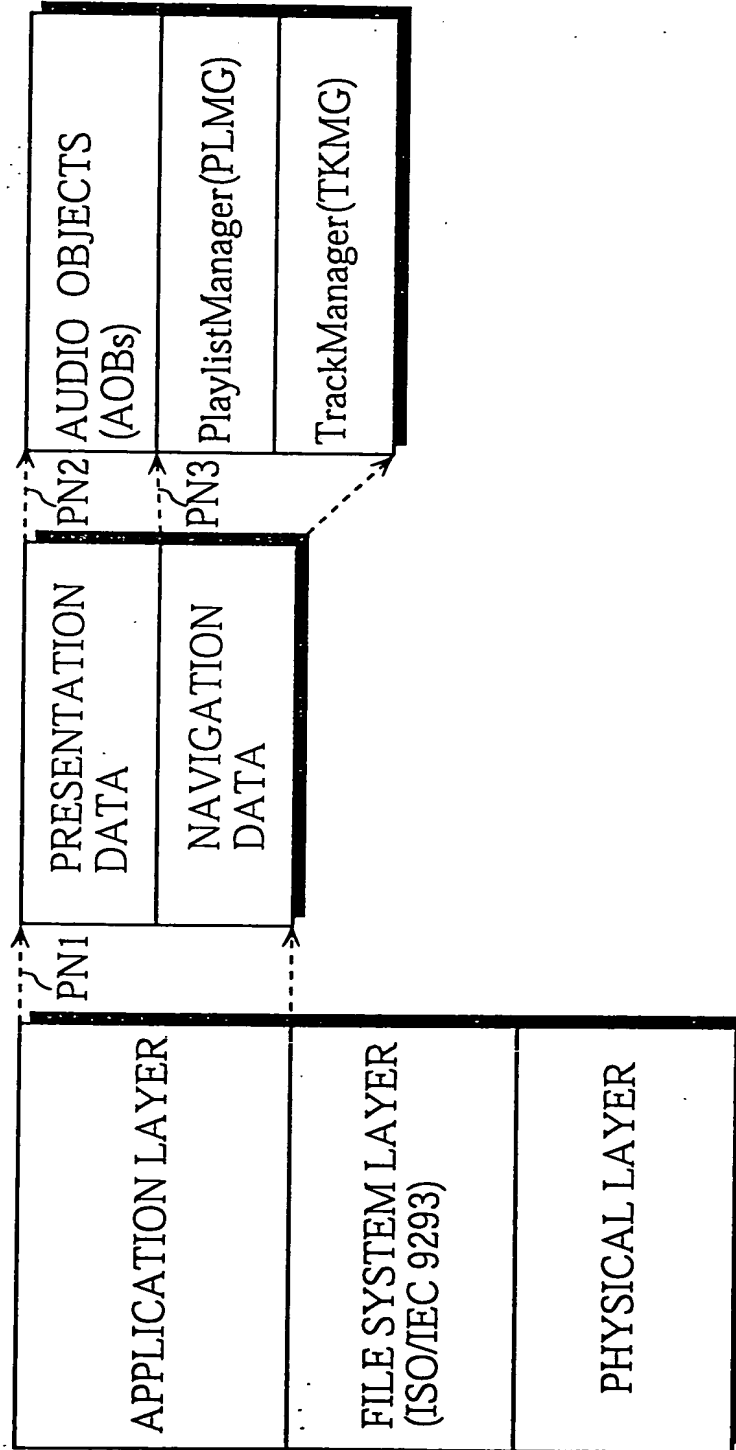


FIG. 4A

FIG. 4A

PHYSICAL LAYER

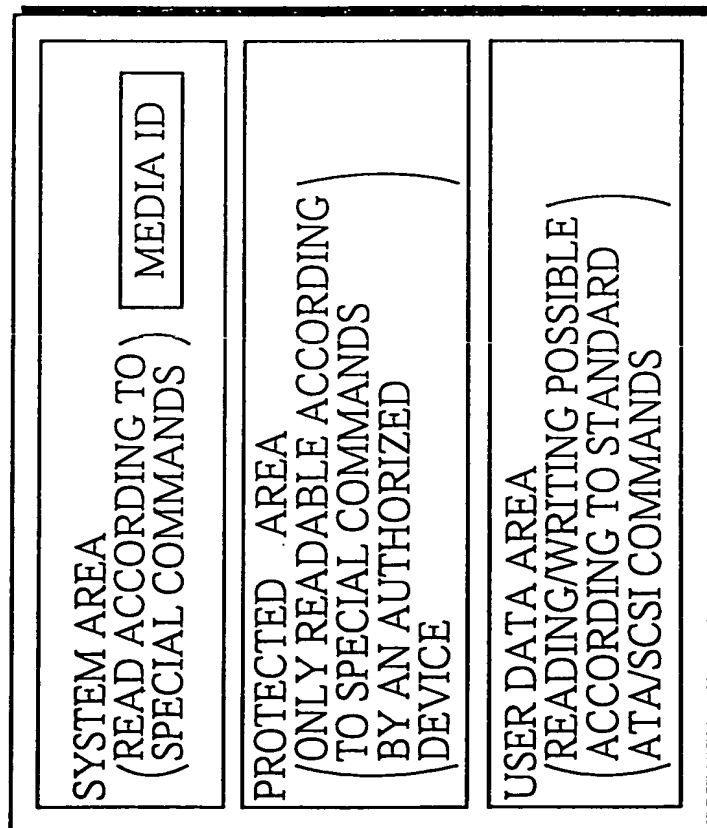


FIG. 4B

FILE SYSTEM LAYER  
(ISO/IEC 9293)

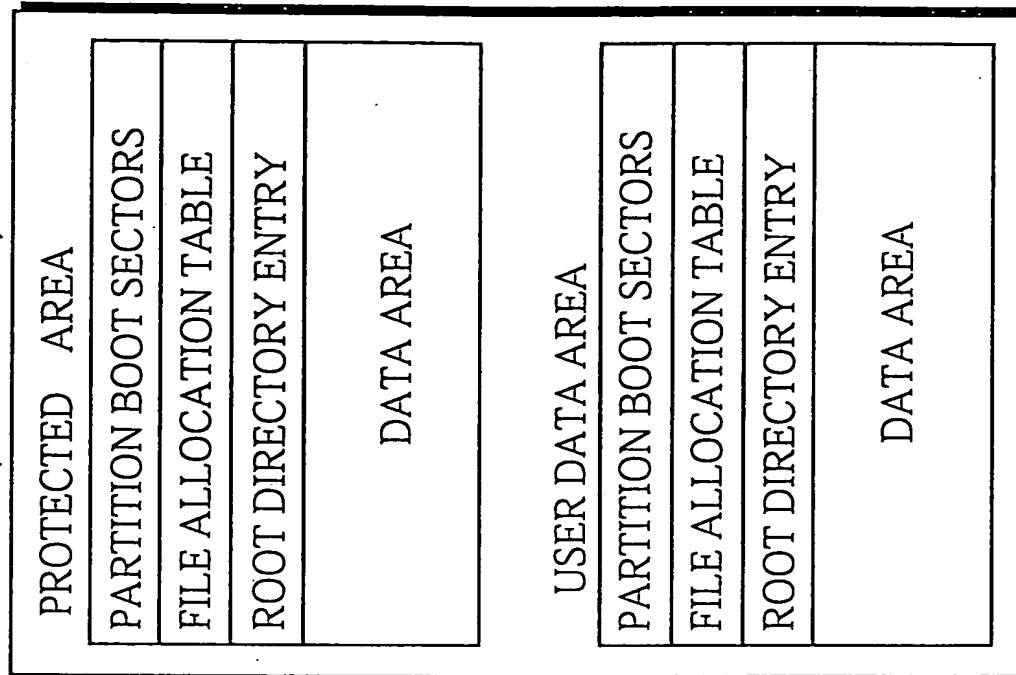


FIG. 5 is a block diagram of a file system layout. The diagram shows a partition boot sectors area, a file allocation table, a root directory entries area, and an SD-audio directory entry. The SD-audio directory entry points to a cluster chain starting with cluster 002, followed by clusters 003 through 01F, and then clusters 020 through 024. The cluster chain is shown as a sequence of clusters, with the last cluster pointing to the next cluster in the chain.

USER DATA AREA

FIG. 5

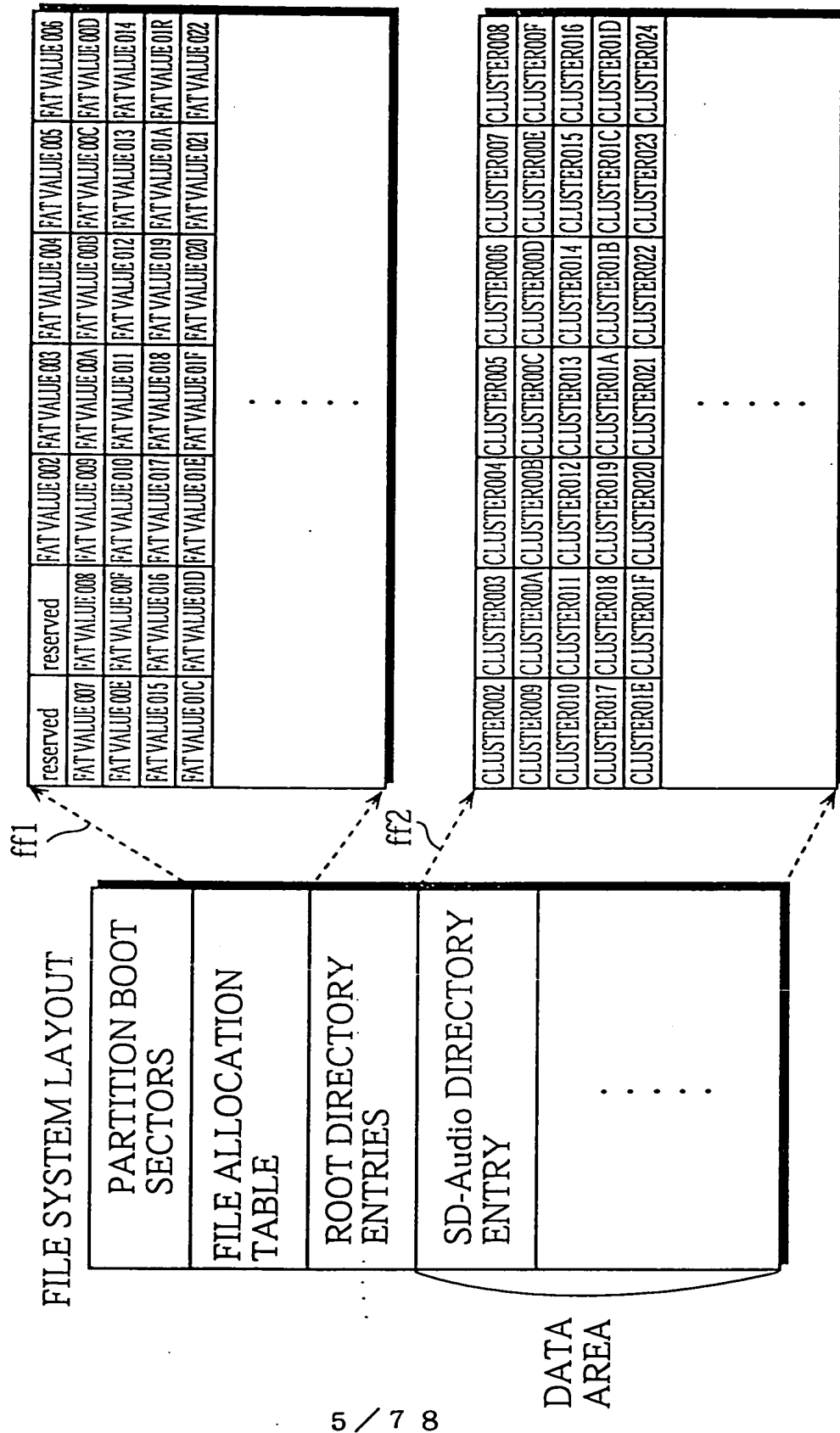
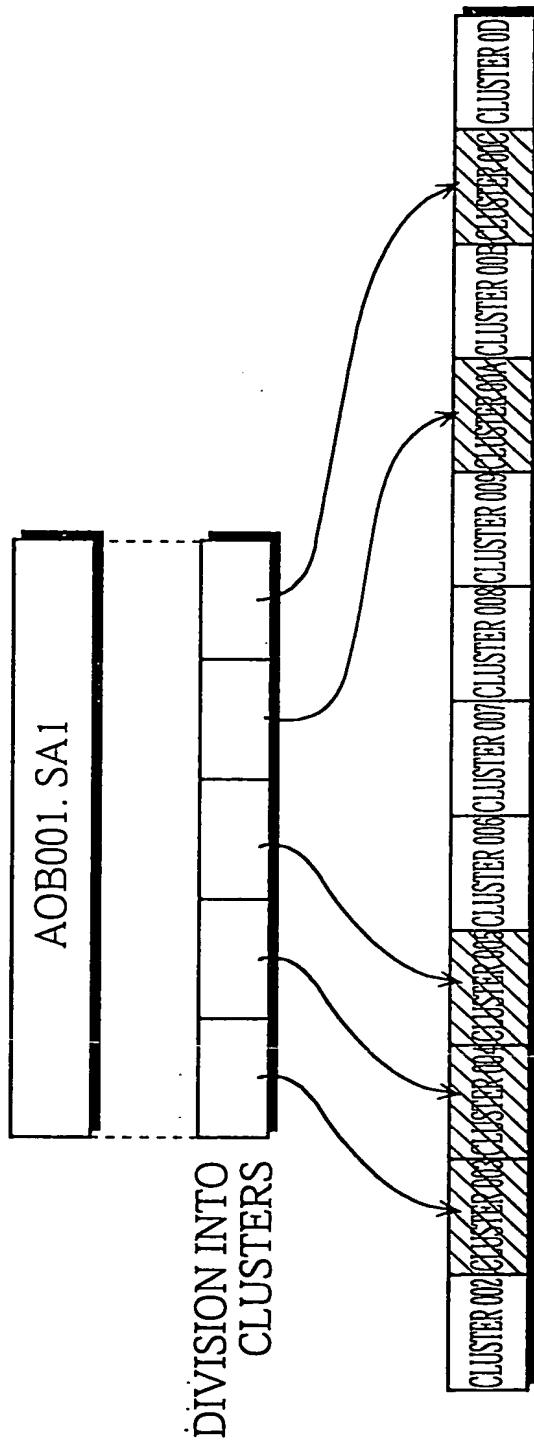


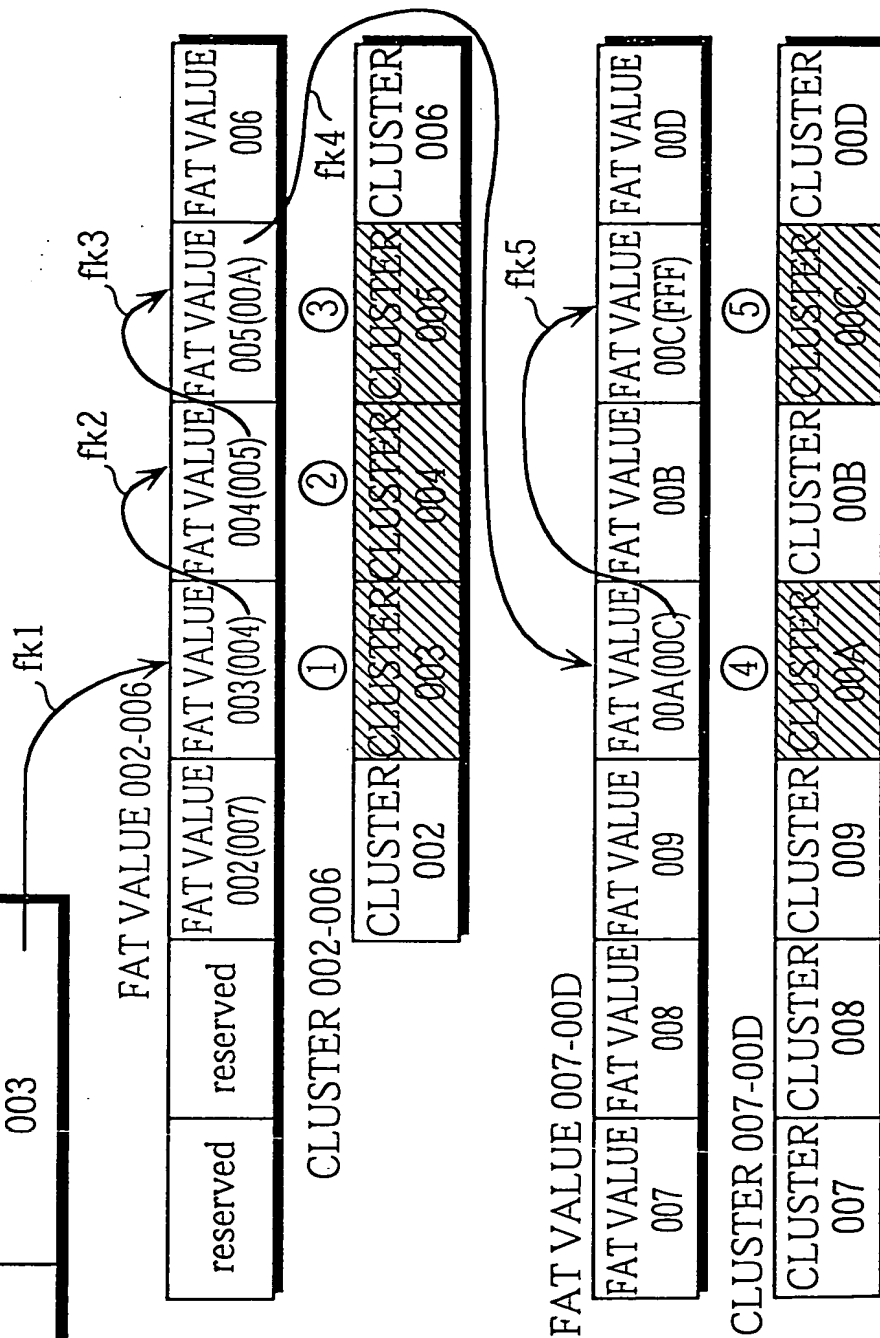
FIG. 6



# SD-Audio DIRECTORY ENTRY

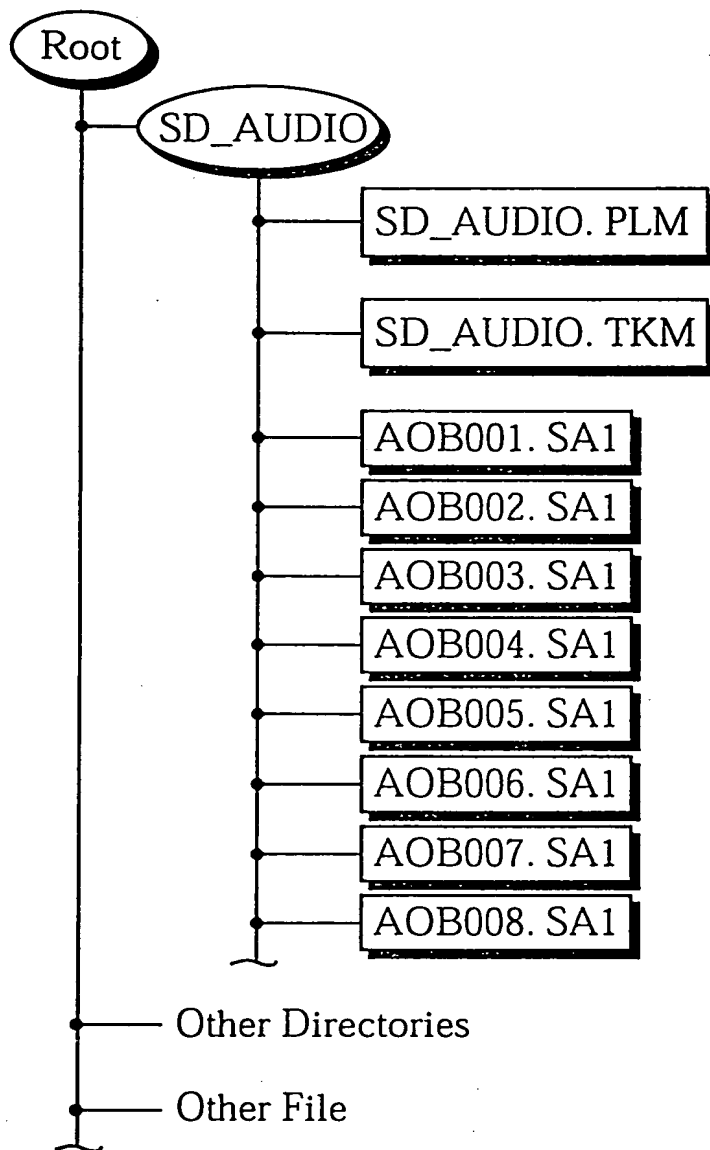
FIG. 7

FILE NAME	FILENAME EXTENSION	NUMBER OF FIRST CLUSTER IN FILE
AOB001	SA1	003



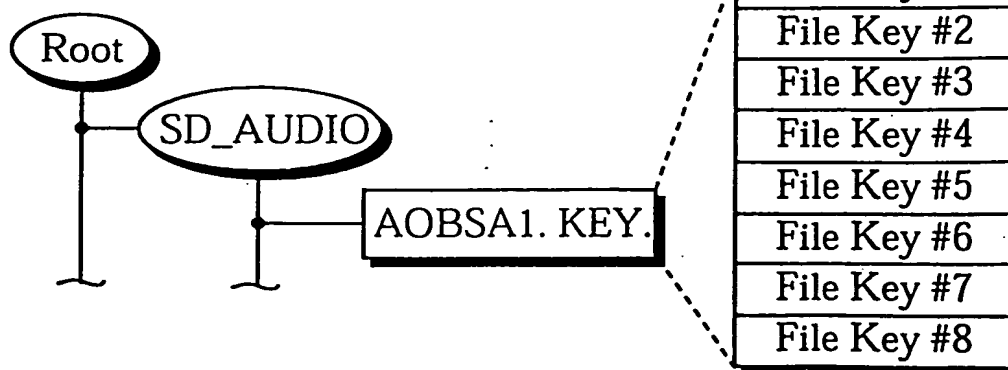
USER DATA AREA

FIG. 8A



PROTECTED AREA

FIG. 8B





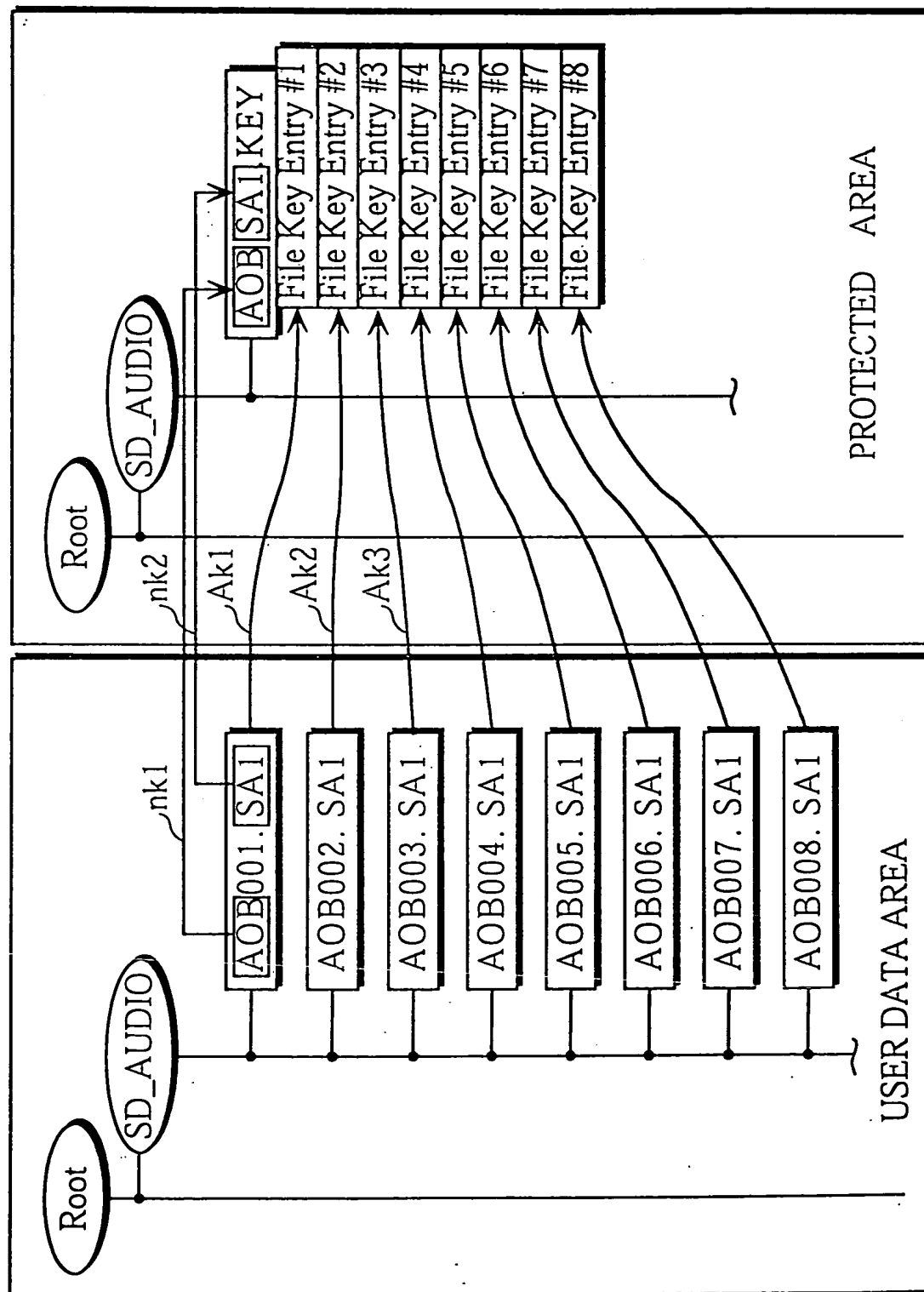


FIG. 9

FIG. 10

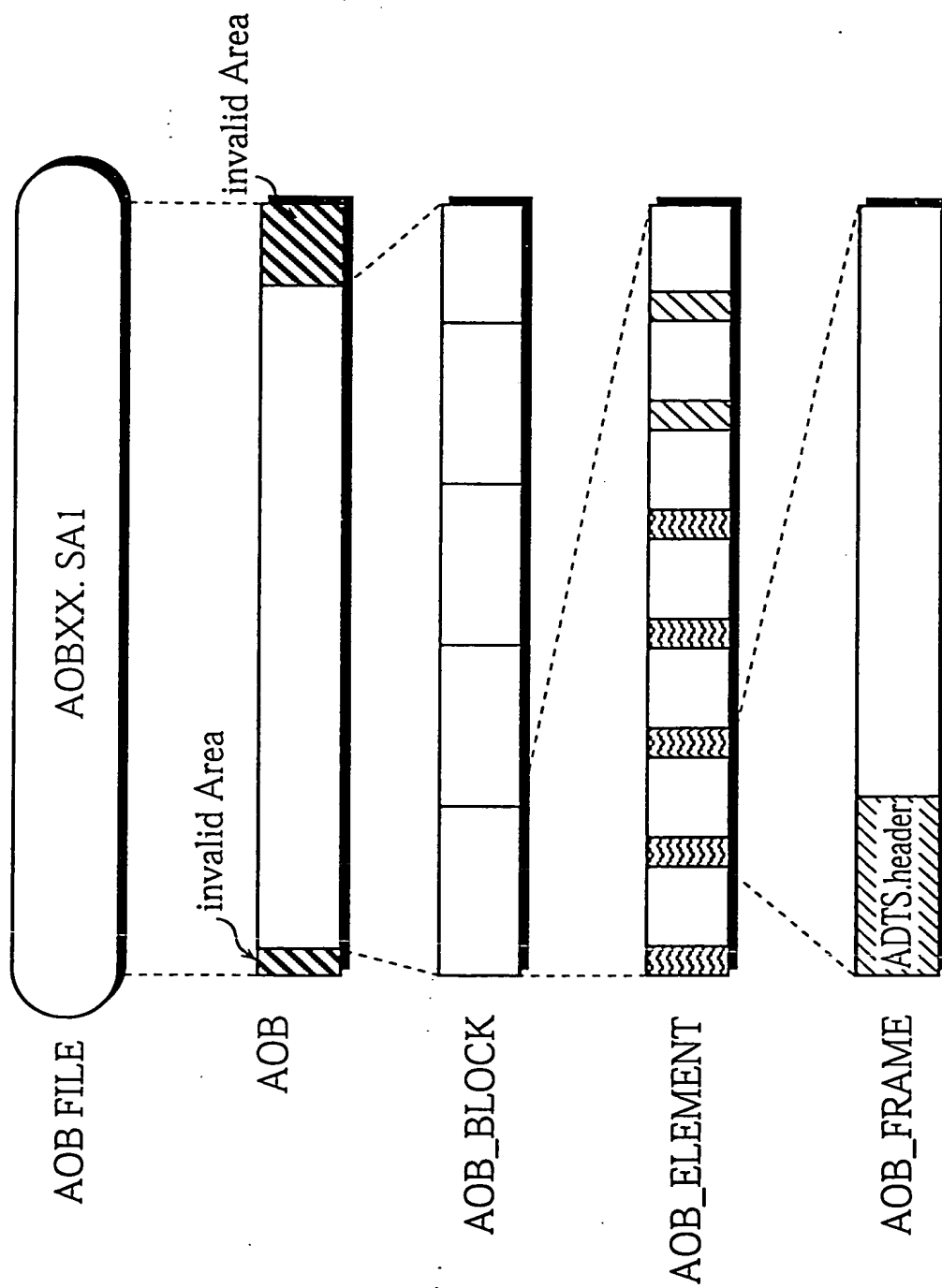


FIG. 11A

## MPEG2-AAC format

format	Audio_Data_Transport_Stream(ADTS)
Profile	Low Complexity(LC) profile(mandatory)
bitrate per channel**	between 16kbit/s(min.)and 72kbit/s(max.) Other bitrates are optional.
sampling_frequency	48 kHz(mandatory) 44.1 kHz(mandatory) 32 kHz(mandatory) 24 kHz(mandatory) 22.05 kHz(mandatory) 16 kHz(mandatory)
channel_configuration	single_channel_element(mandatory) channel_pair_element(mandatory)
number_of_data_blocks_in_frame	1 header/1 raw_data_block(mandatory)

FIG. 11B

## MPEG layer 3 format

format	MPEG-1 layer 3 MPEG-2 layer 3 low sampling frequency
bitrate per channel**	MPEG 1:between 16kbit/s and 96kbit/s MPEG 2 LSF:between 16kbit/s and 80kbit/s Other bitrates and variable bitrate are optional. Bitrate index "0000",i.e. "free format" is not supported.
sampling_frequency	48 kHz 44.1 kHz 32 kHz 24 kHz 22.05 kHz 16 kHz
mode	stereo joint_stereo single_cannel

FIG. 11C

## Windows Media Audio format

format	Windows Media Audio format
bitrate per channel**	between 8kbit/s and 80kbit/s Other bitrates are optional.
sampling_frequency	48 kHz 44.1 kHz 32 kHz 22.05 kHz 16 kHz
mode	monaural stereo

FIG. 12

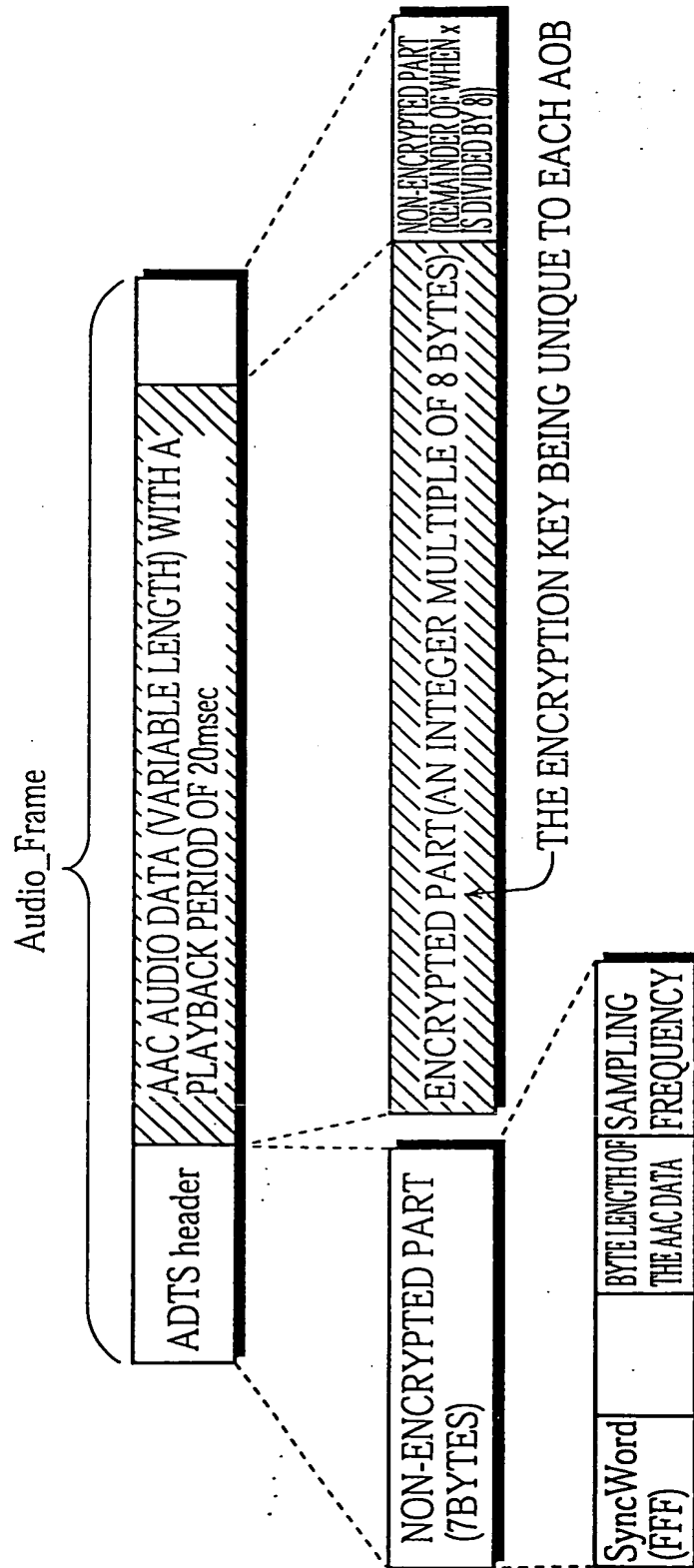


FIG. 13

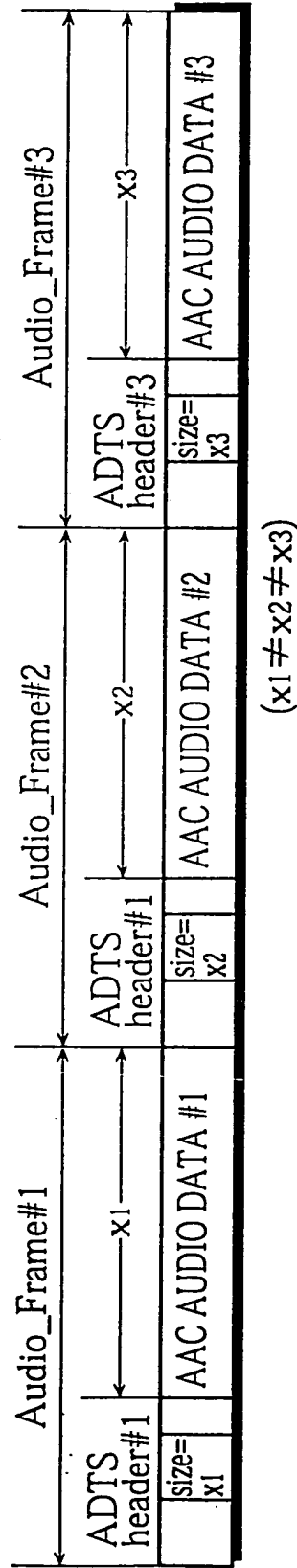


FIG. 14

sampling frequency	FNs_Middle_TMSRTE		
	AAC	MPEGLayer3	WMA
48kHz	47*N	42*N	×××
44.1kHz	43*N	38*N	×××
32kHz	32*N	28*N	×××
24kHz	24*N	42*N	×××
22.05kHz	22*N	38*N	×××
16kHz	16*N	28*N	×××

※ N BEING THE PLAYBACK PERIOD "TIME\_LENGTH"  
OF AN AOB\_ELEMENT TO AN ACCURACY OF 1/1000TH  
OF ONE SECOND

FIG. 15

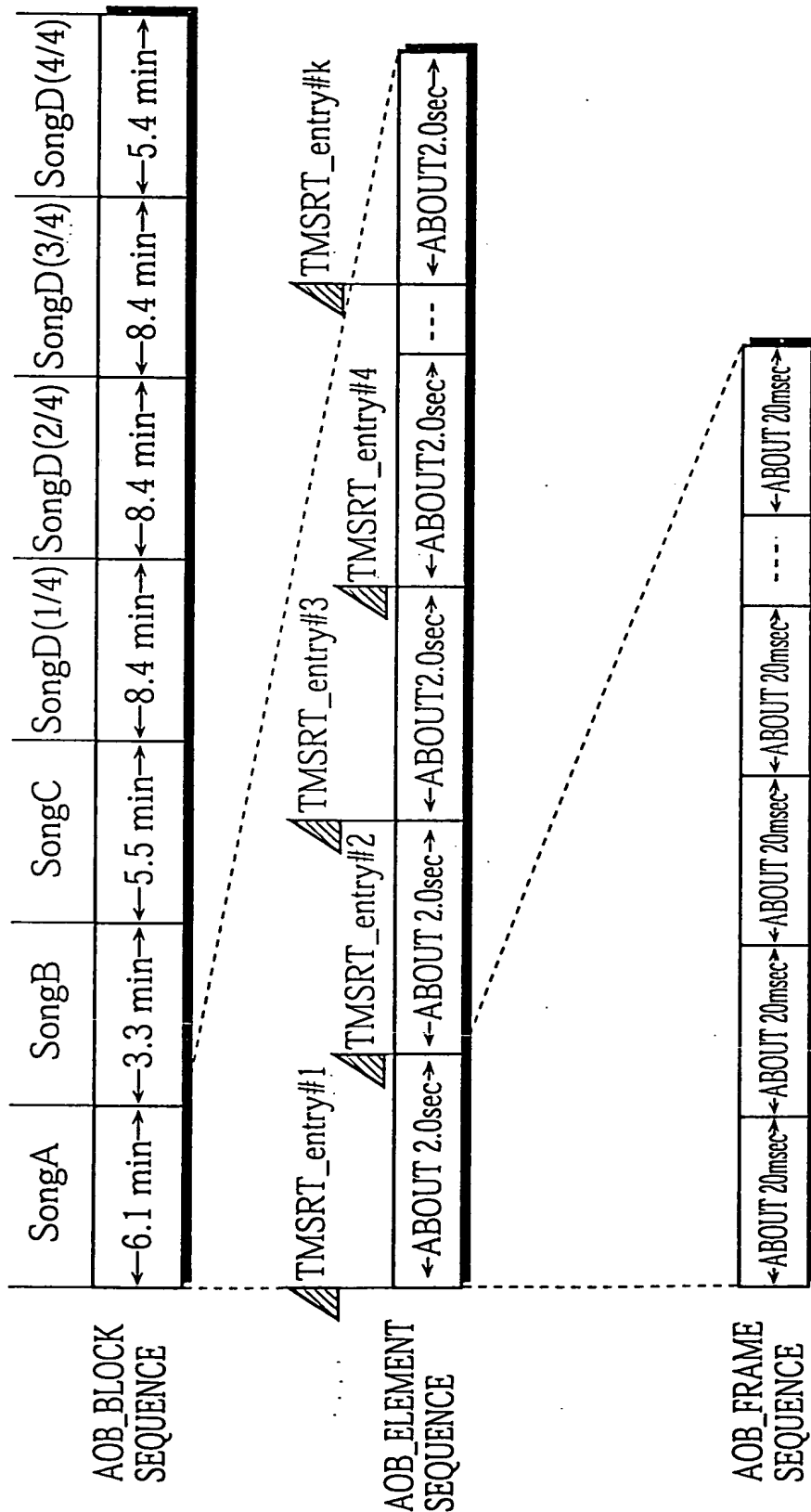


FIG. 16

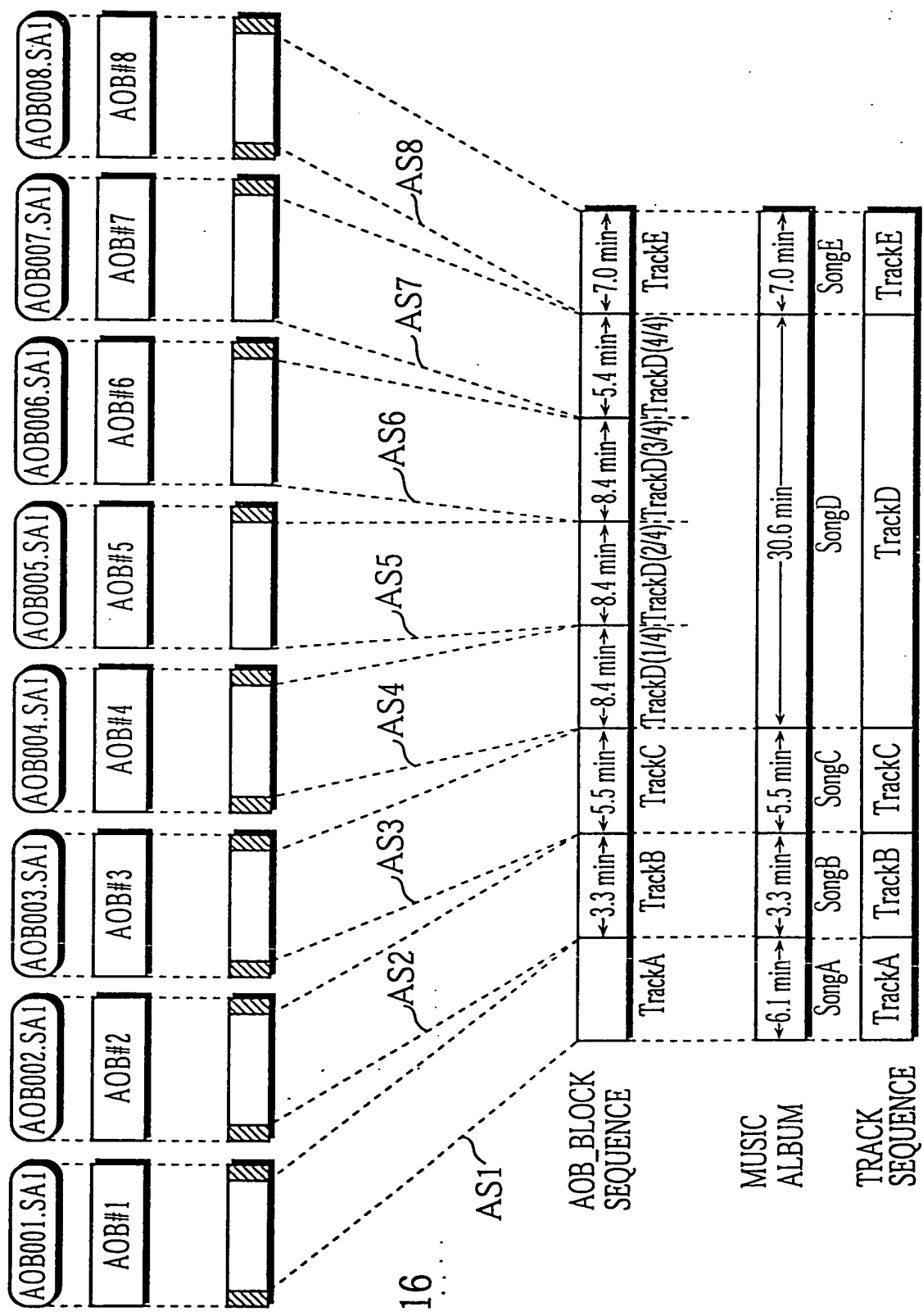




FIG. 17

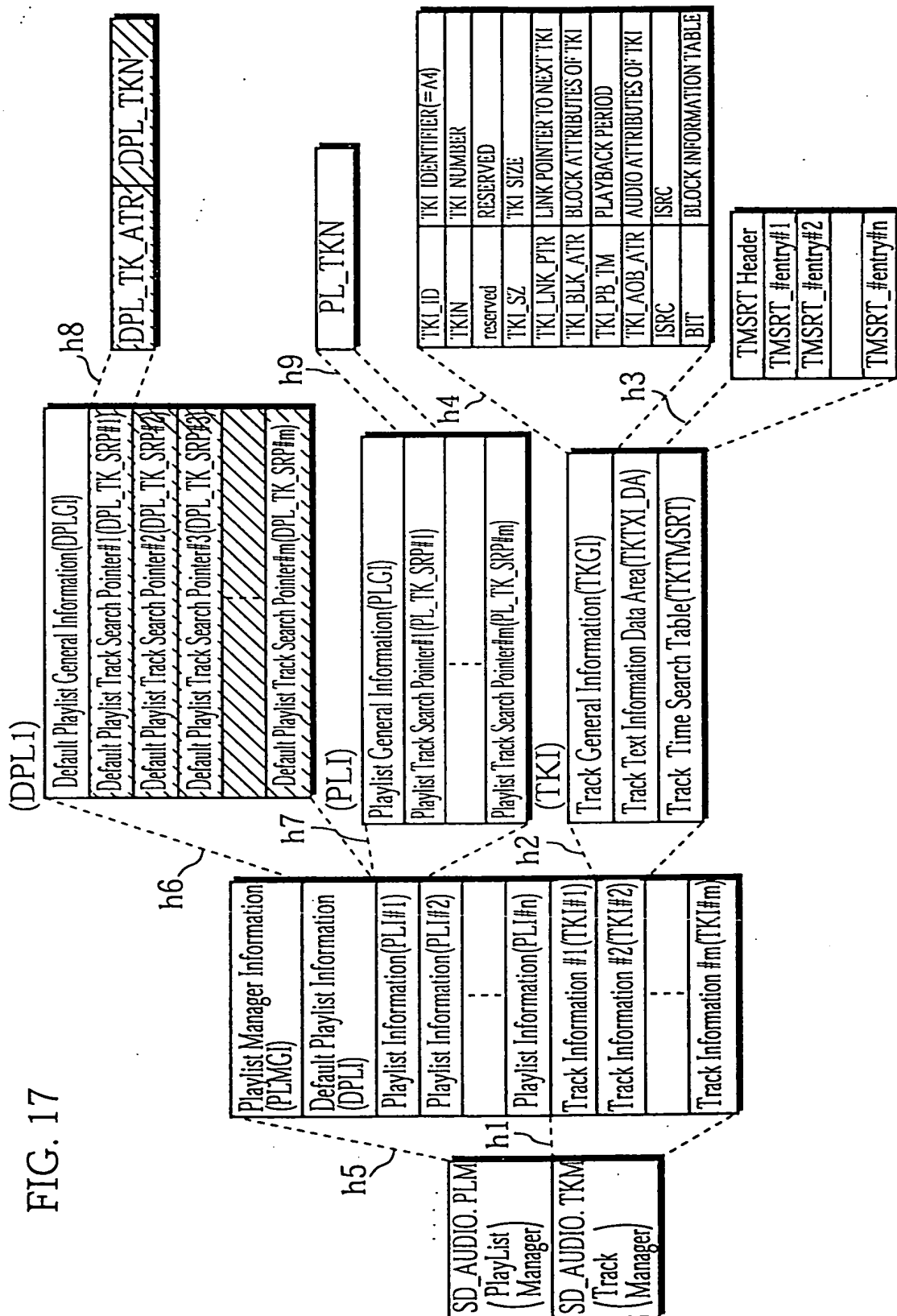


FIG. 18

(PLMG)

Playlist Manager Information(PLMGI)	FIXED LENGTH (2.5KByte)
Default Playlist Information(DPLI)	
Playlist Information#1 (PLI#1)	FIXED LENGTH (512Byte)
⋮	
Playlist Information#n(PLI#n) $(1 \leq n \leq 99)$	FIXED LENGTH (512Byte)
Track Information #1 (TKI#1)	FIXED LENGTH (1024Byte)
⋮	
Track Information #m(TKI#m)	FIXED LENGTH (1024Byte)

$(1 \leq m \leq 999)$

FIG. 19

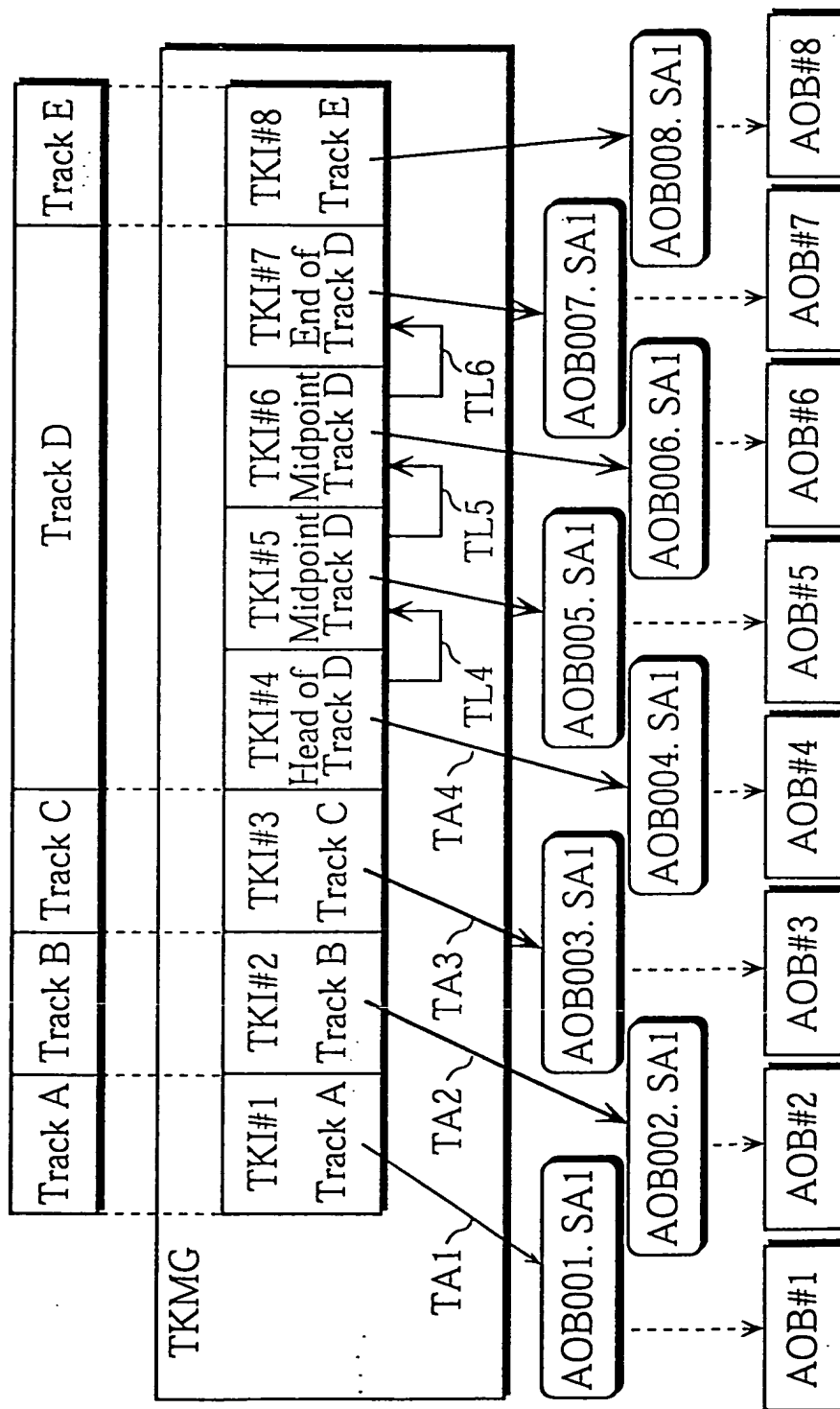


FIG. 20

FIG. 20

(DESCRIPTION ORDER)

RELATIVE BYTE POSITION	FIELD NAME	CONTENT	NUMBER OF BYTES
0 to 1	TMSRT ID	IDENTIFIER OF TMSRT	2 BYTES
2 to 3	reserved	RESERVED	2 BYTES
4 to 7	Total TMSRT_entry Number	TOTAL NUMBER OF TMSRT_entries	4 BYTES
TOTAL			8 BYTES

(DESCRIPTION ORDER)

RELATIVE BYTE POSITION	FIELD NAME	CONTENT	NUMBER OF BYTES
0 to 3	TMSRT_ENT	Size of AOB_ELEMENT	2 Byte × 252
TOTAL			TOTAL 504 BYTES

TMSRT Header
TMSRT_entry #0
TMSRT_entry #1
...
TMSRT_entry #n

FIG. 21

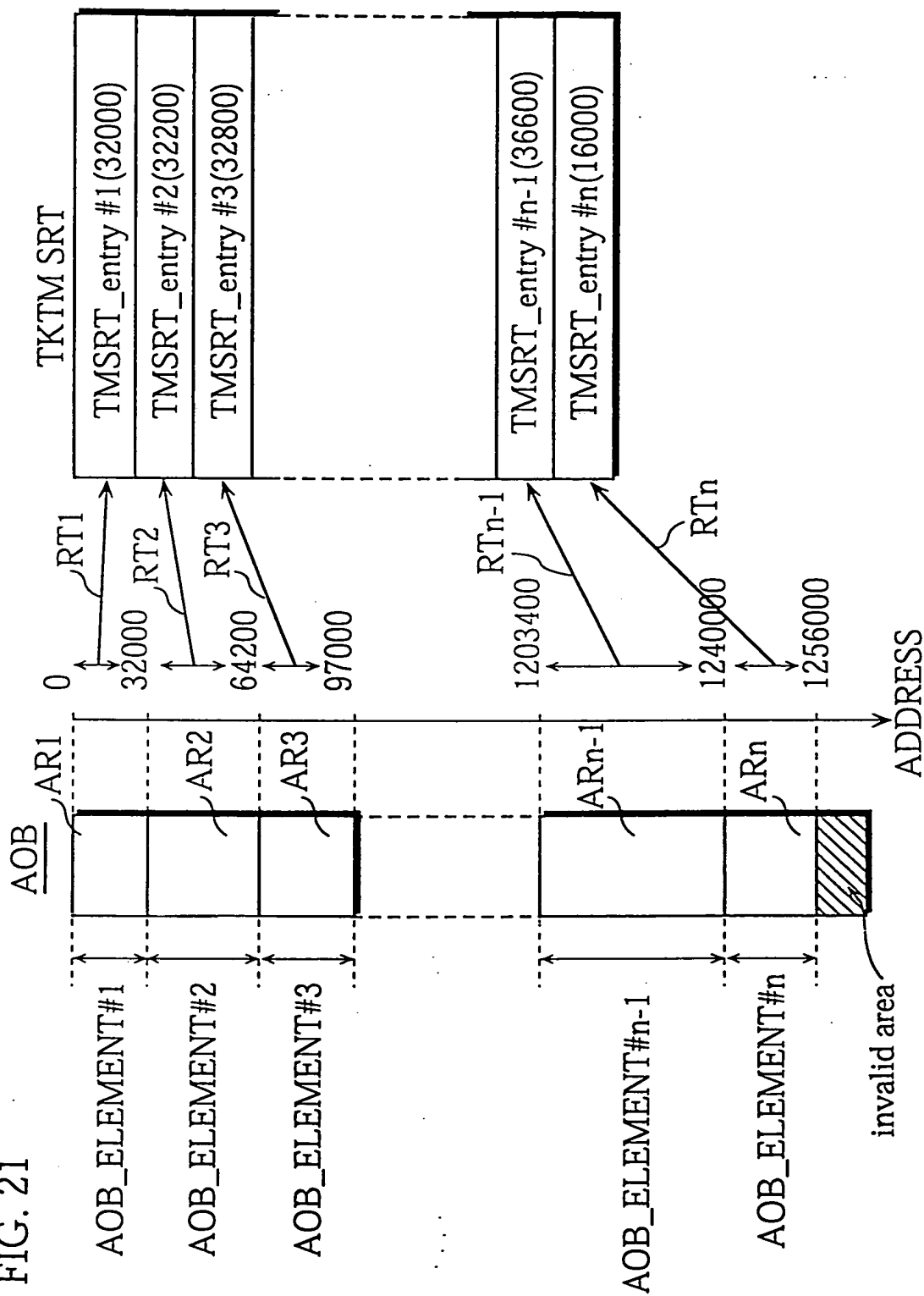
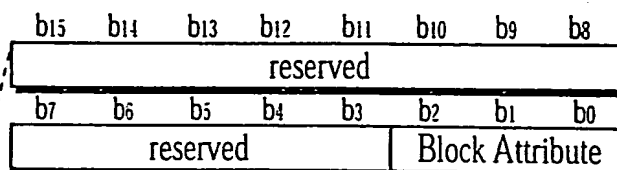


FIG. 22

TKI_ID	TKI IDENTIFIER(=A4)
TKIN	TKI NUMBER
reserved	RESERVED
TKI_SZ	TKI SIZE
TKI_LNK_PTR	LINK POINTER TO NEXT TKI
TKI_BLK_ATR	BLOCK ATTRIBUTES OF TKI
TKI_PB_TM	PLAYBACK PERIOD
TKI_AOB_ATR	AUDIO ATTRIBUTES OF TKI
ISRC	ISRC
BIT	BLOCK INFORMATION TABLE



Block Attribute

- "000B" : 1 SONG IN TKI
- "001B" : START OF SONG IN TKI
- "010B" : MIDDLE OF SONG IN TKI
- "011B" : END OF SONG IN TKI
- "100B" : DELETED TKI
- "101B" : TKI IN INITIAL STATE

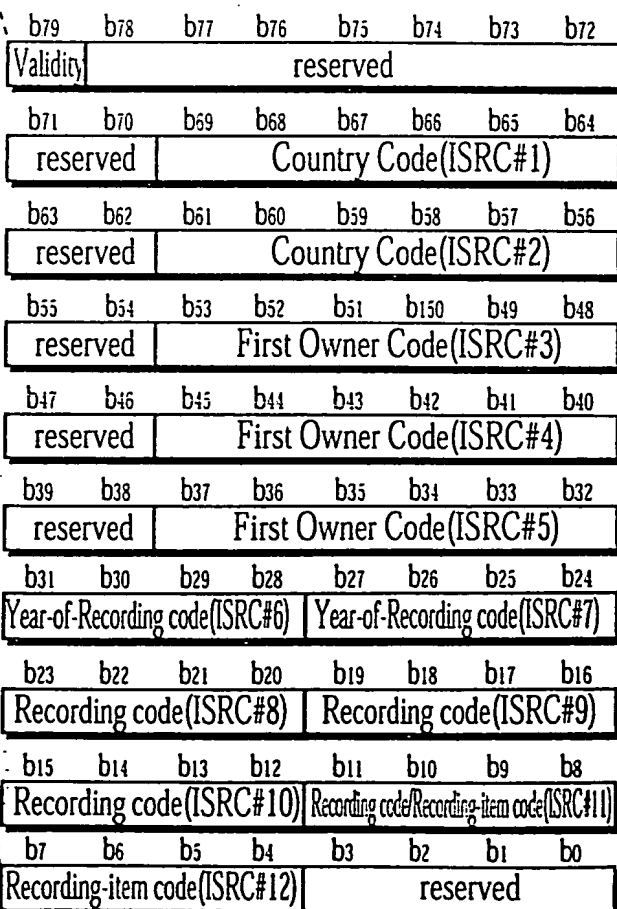
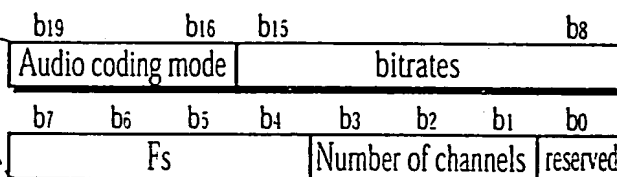


FIG. 23A

RELATIVE BYTE POSITION	FIELD NAME	CONTENT	NUMBER OF BYTES
60 to 63	DATA_OFFSET	FIRST ADDRESS OF AOB_BLOCK	4BYTES
64 to 67	SZ_DATA	DATA LENGTH OF AOB_BLOCK	4BYTES
68 to 71	TMSRTE_Ns	NUMBER OF TMSRTE_entries	4BYTES
72 to 73	FNs_1st_TMSRTE	NUMBER OF AOB_FRAMES IN FIRST AOB_ELEMENT	2BYTES
74 to 75	FNs_Last_TMSRTE	NUMBER OF AOB_FRAMES IN LAST AOB_ELEMENT	2BYTES
76 to 77	FNs_Middle_TMSRTE	NUMBER OF AOB_FRAMES IN AOB_ELEMENTS	2BYTES
78 to 79	TIME_LENGTH	PLAYBACK PERIOD OF AOB_ELEMENTS	2BYTES
TOTAL			20BYTES

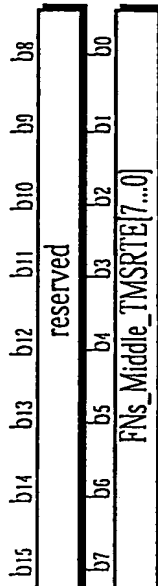
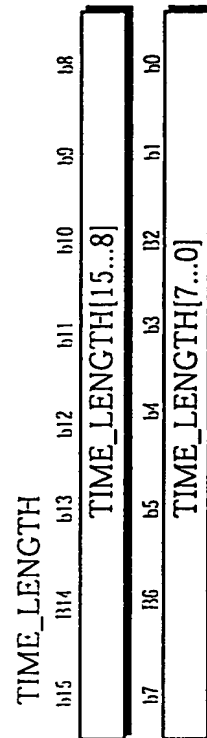


FIG. 23B

sampling frequency	FNs_Middle_TMSRTE	
	AAC	MPEGlayer3
48kHz	47*N	42*N
44.1kHz	43*N	38*N
32kHz	32*N	28*N
24kHz	24*N	42*N
22.05kHz	22*N	38*N
16kHz	16*N	28*N

\* N BEING THE PLAYBACK PERIOD "TIME\_LENGTH"  
OF AN AOB\_ELEMENT TO AN ACCURACY OF 1/1000TH  
OF ONE SECOND

FIG. 23C



TIME\_LENGTH=2000 FOR AAC.MP3

FIG. 24

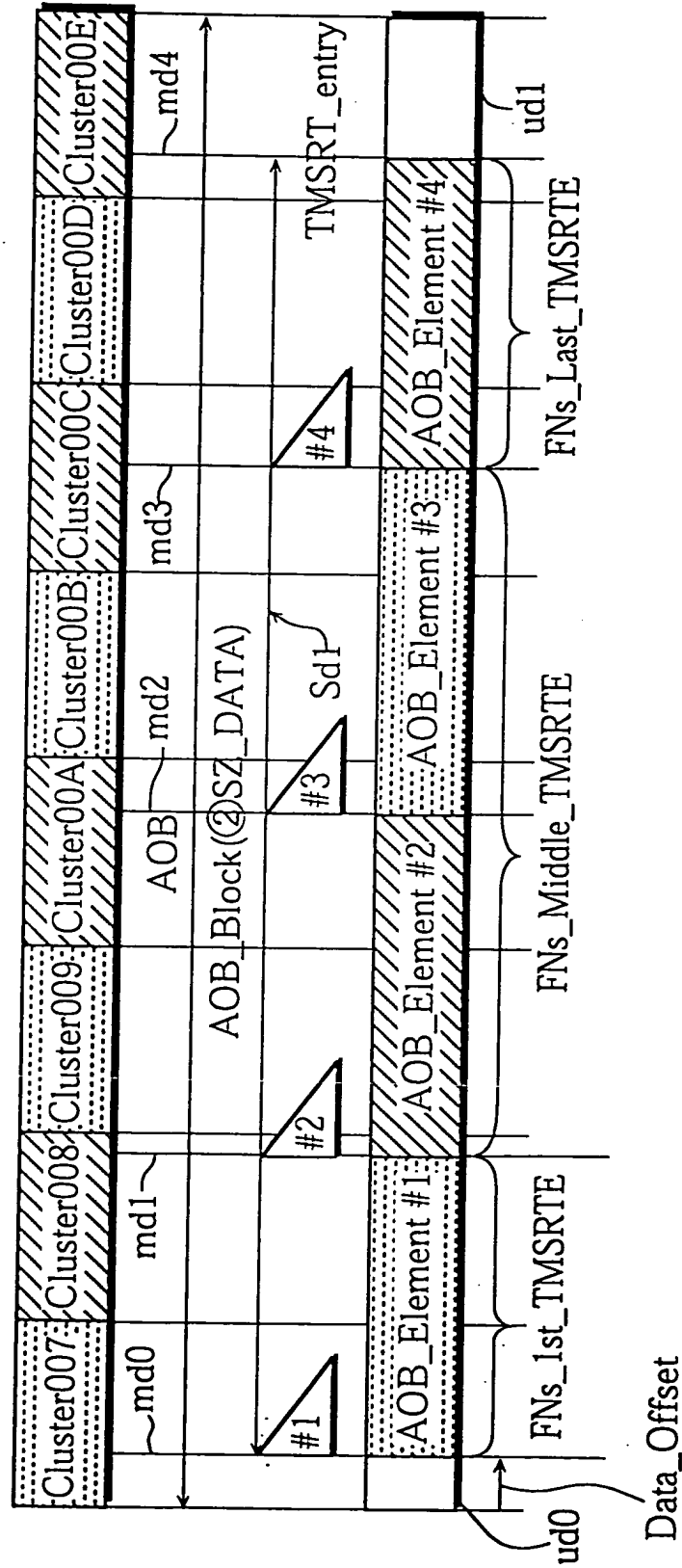




FIG. 25

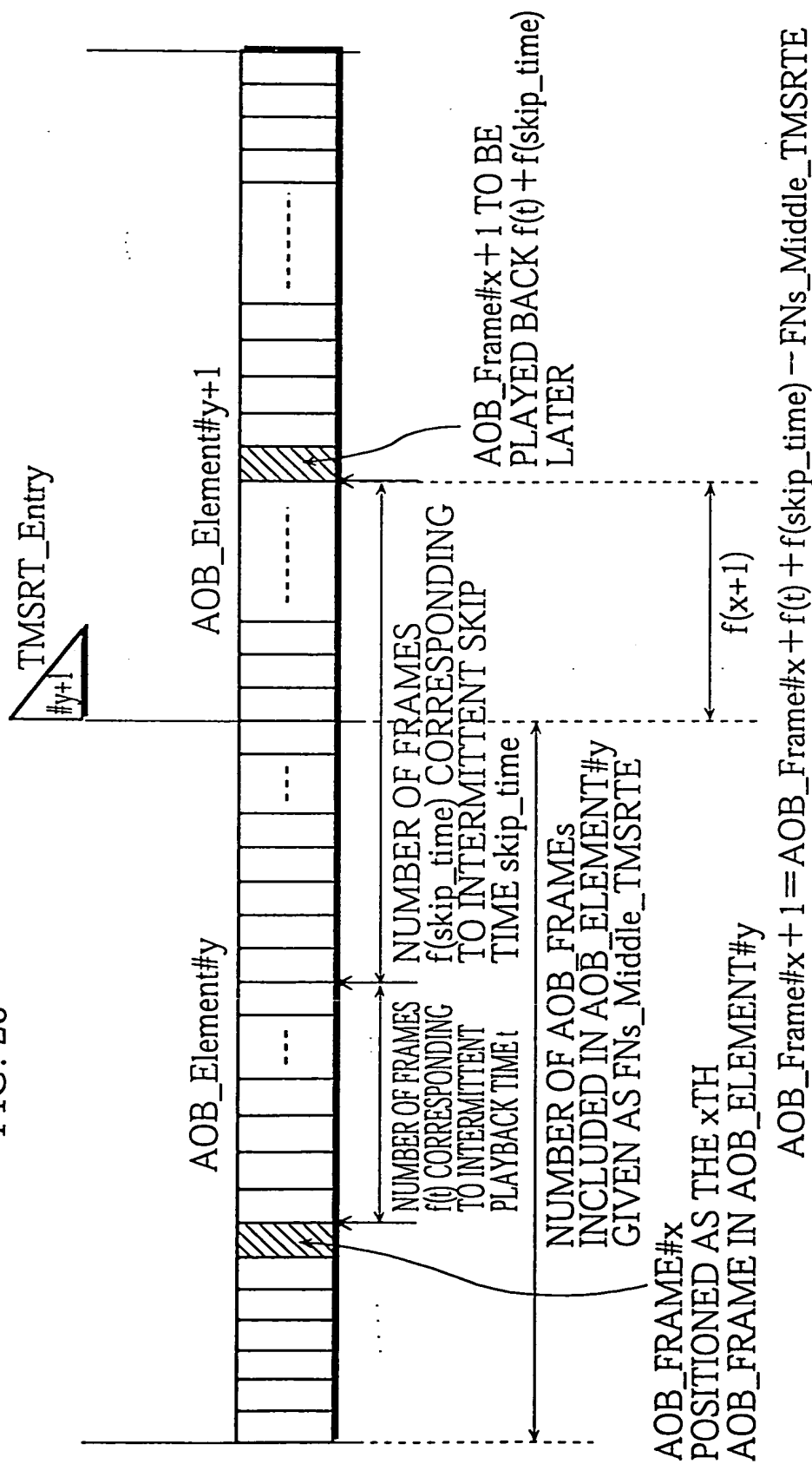
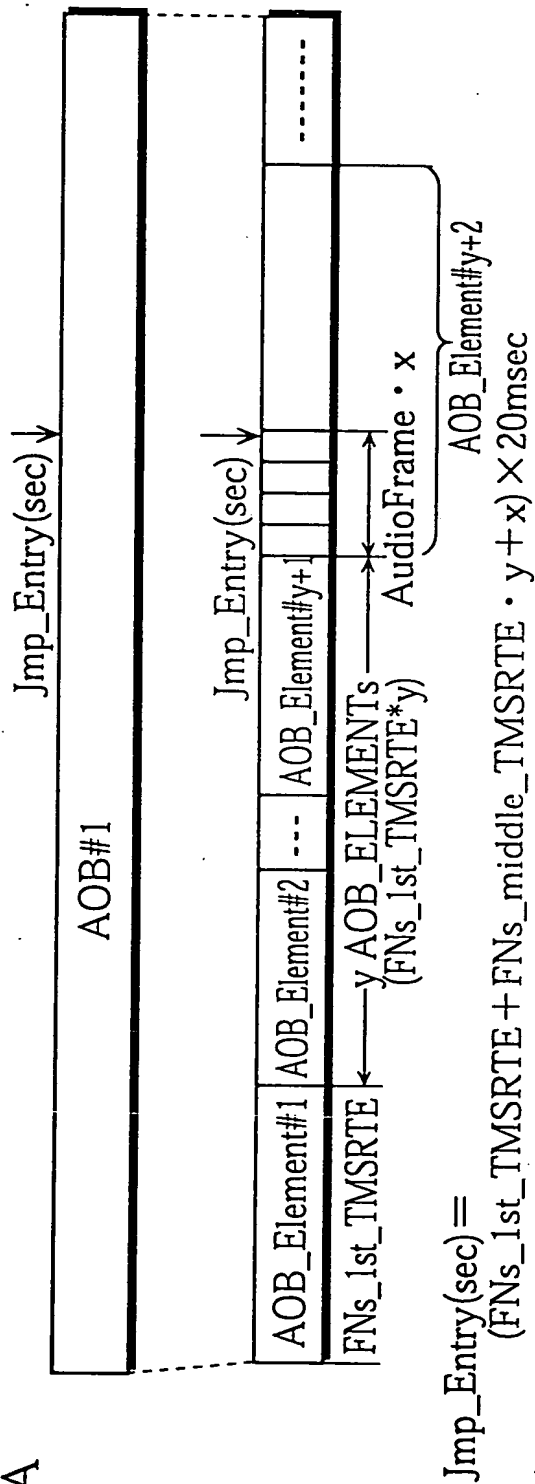
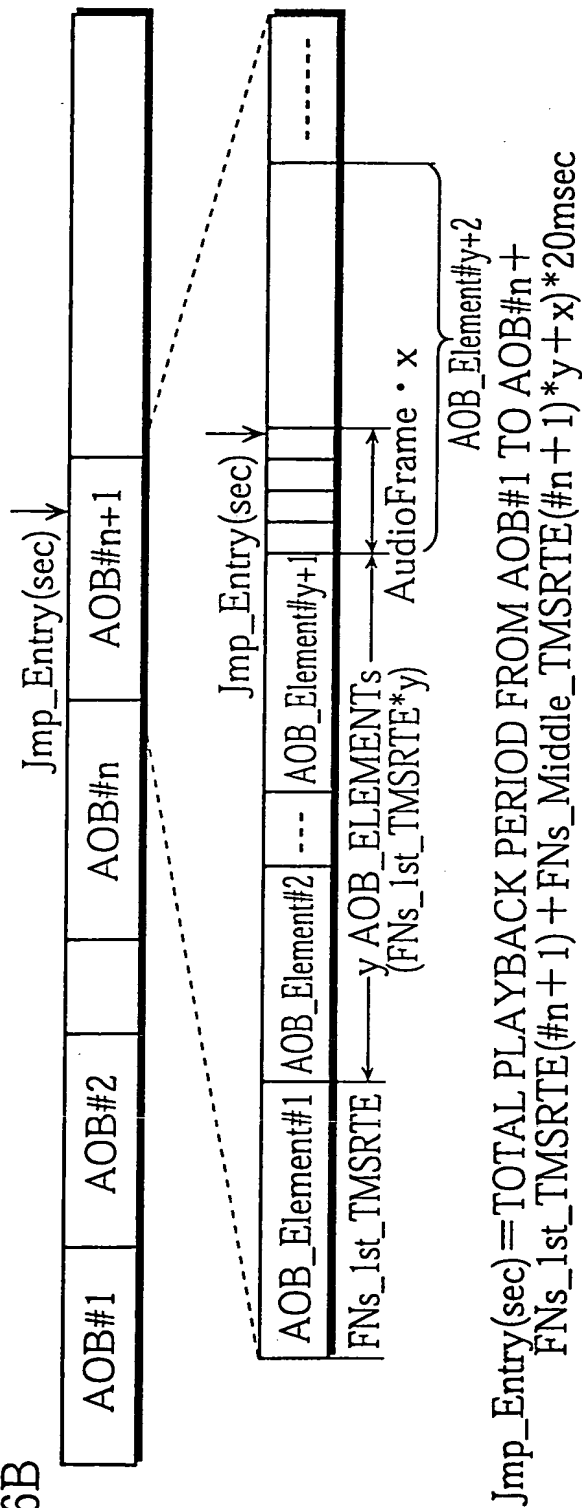


FIG. 26A



2 6 / 7 8

FIG. 26B



$$\text{Imp\_Entry(sec)} = \text{TOTAL PLAYBACK PERIOD FROM AOB\#1 TO AOB\#n} + \text{FNs\_1st\_TMSRTE}(\#n + 1) + \text{FNs\_Middle\_TMSRTE}(\#n + 1) \cdot y + x \cdot 20\text{msec}$$

FIG. 27A

DELETION OF Track B(case 1)

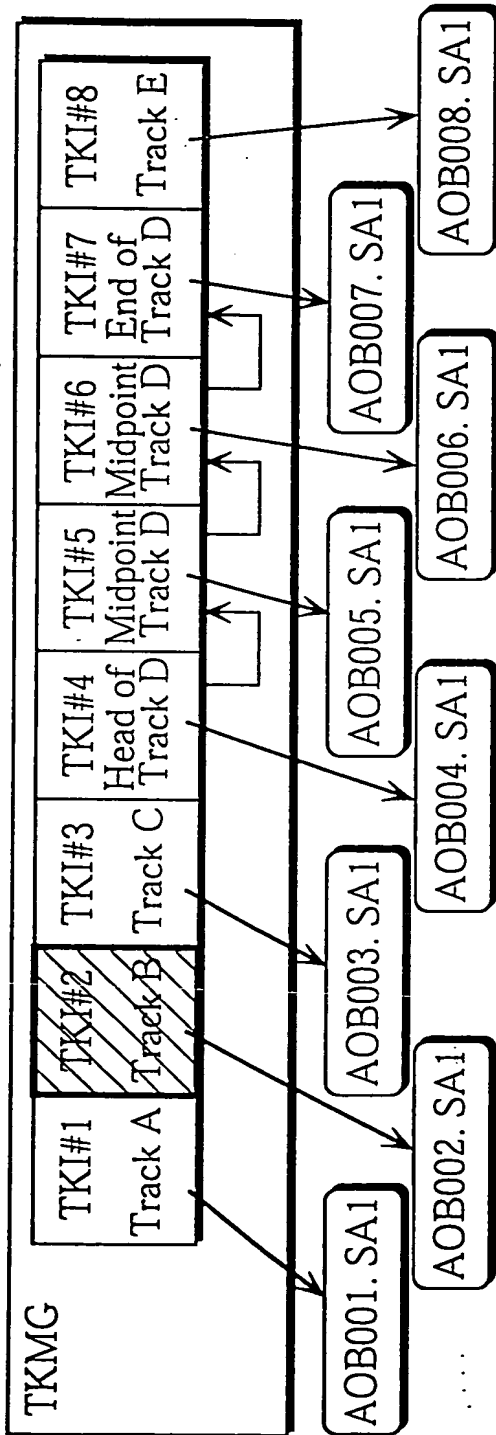


FIG. 27B

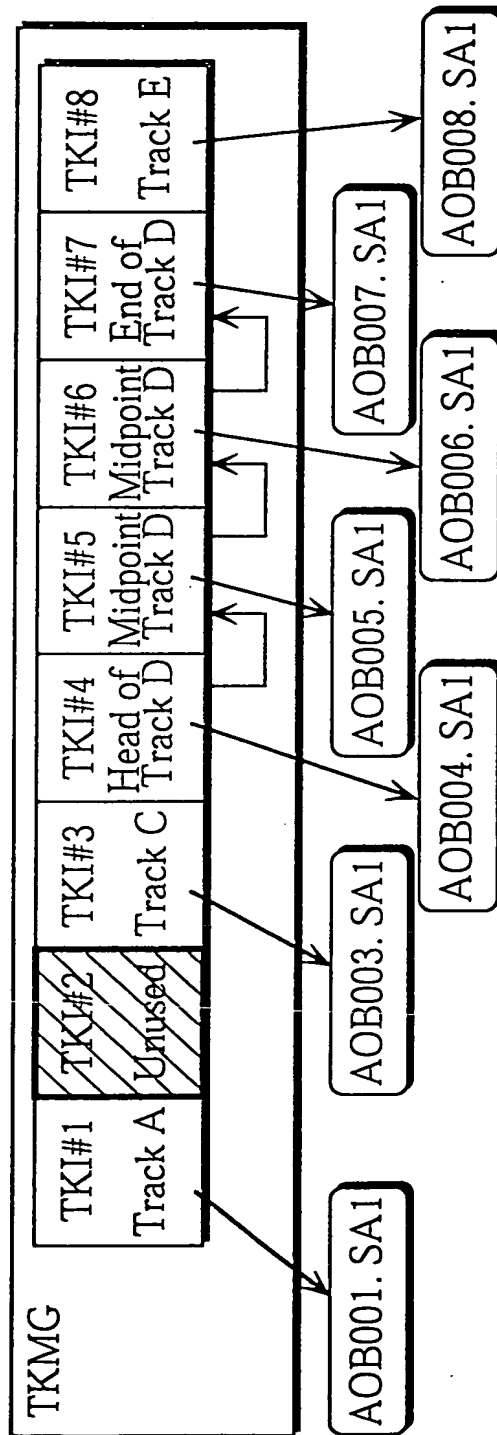


FIG. 28A UPDATING TrackManager USING UNUSED TKI AT DIFFERENT POSITIONS(case 2)

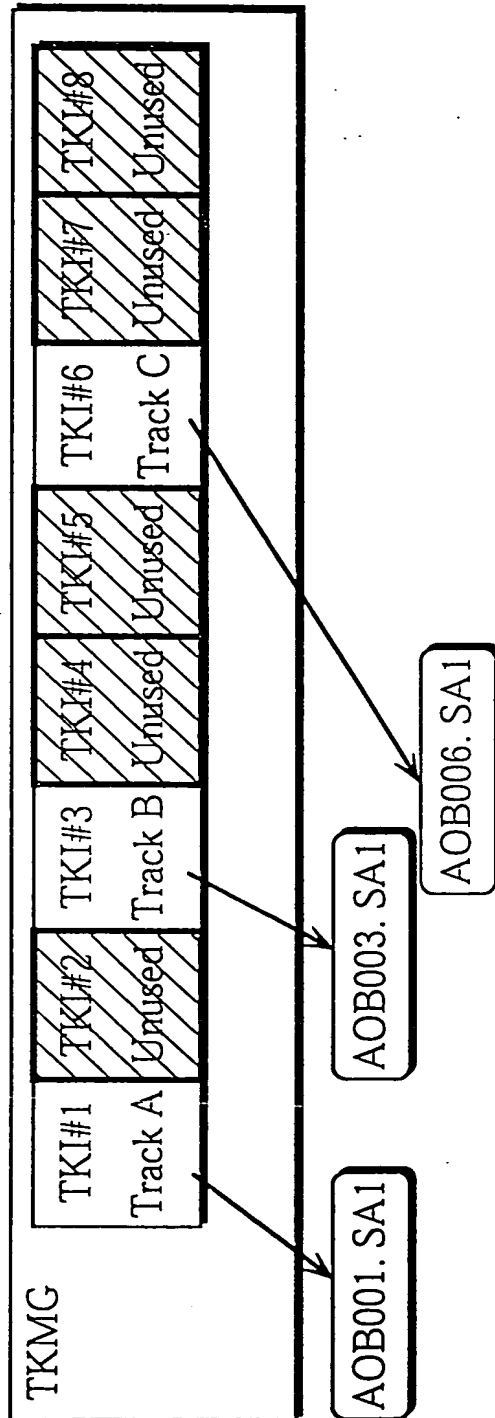


FIG. 28B

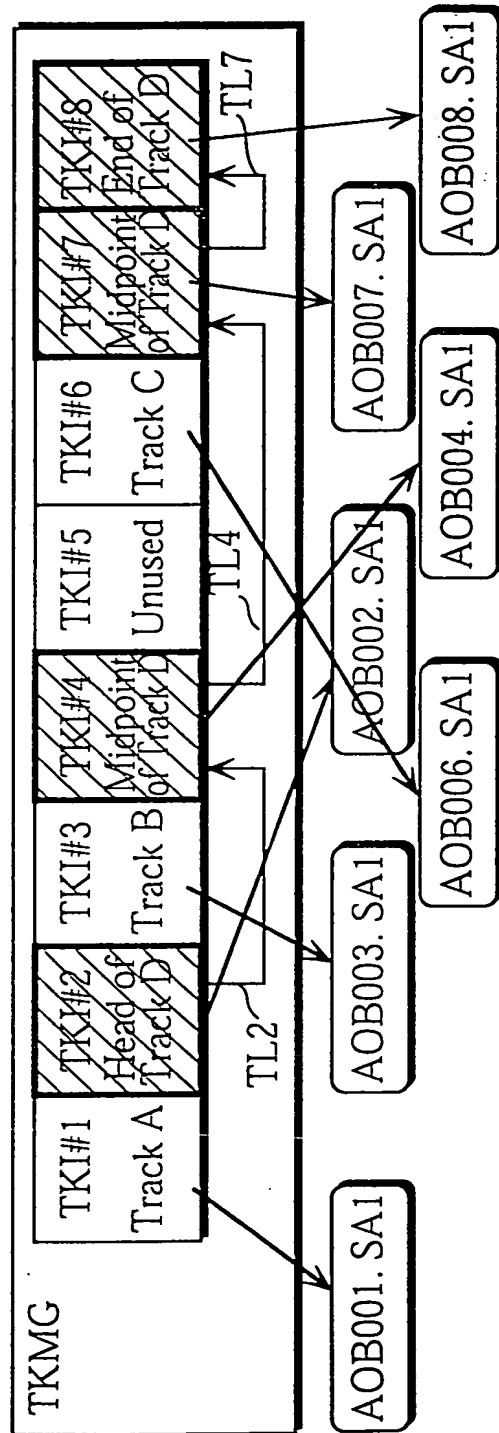


FIG. 29A

COMBINING OF Track C AND Track E TO PRODUCE NEW Track C(case 3)

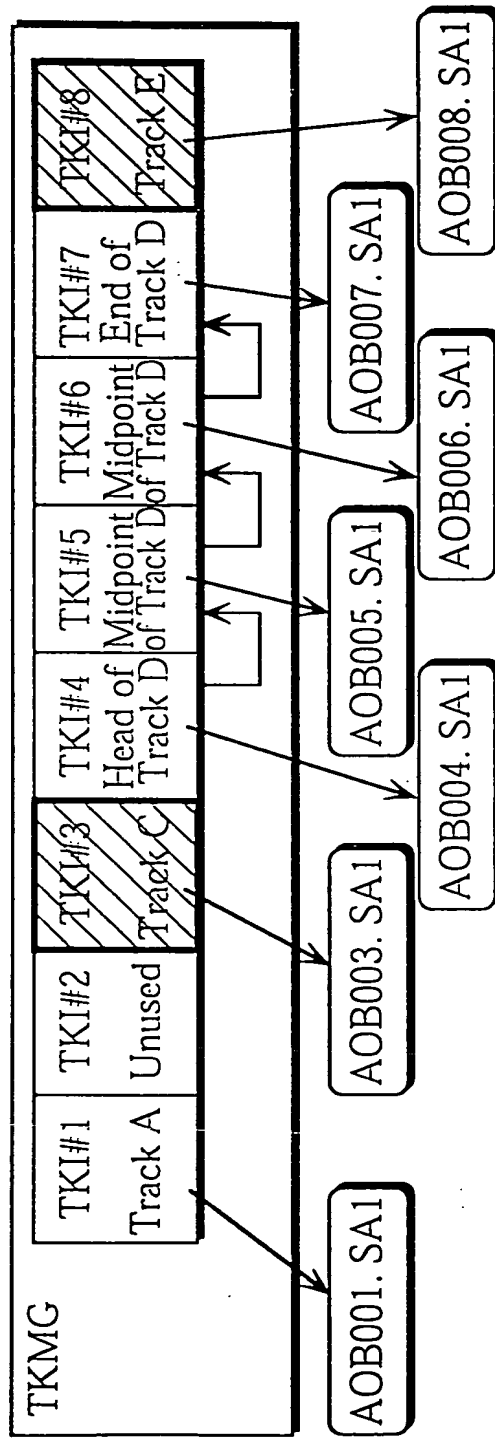


FIG. 29B

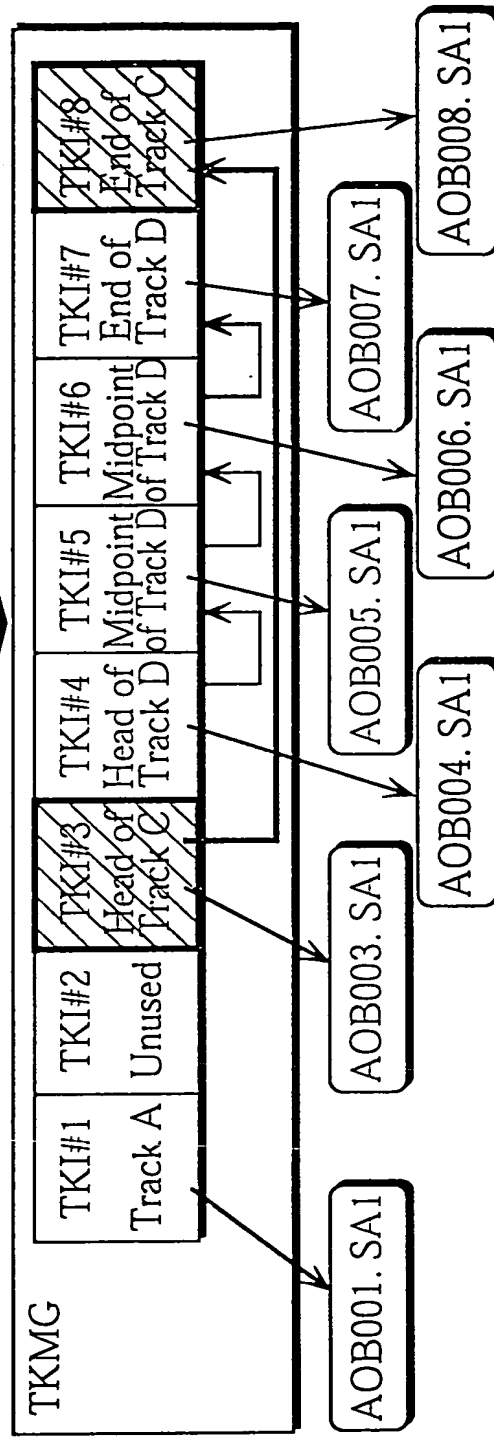


FIG. 30A

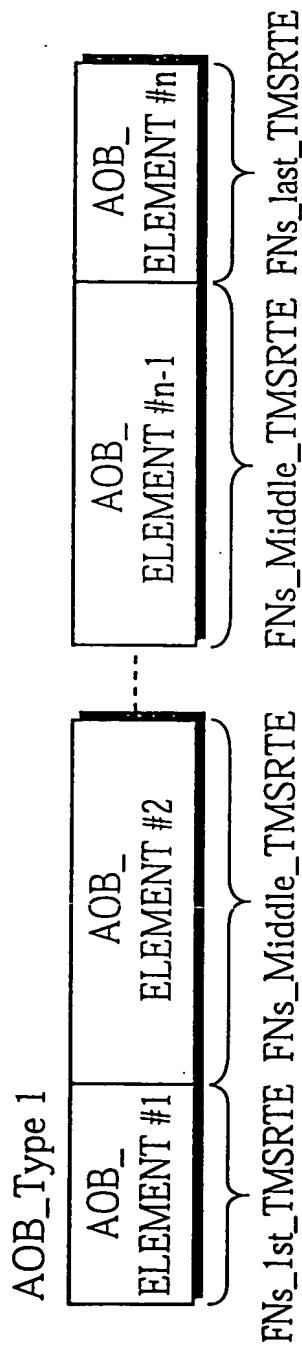


FIG. 30B

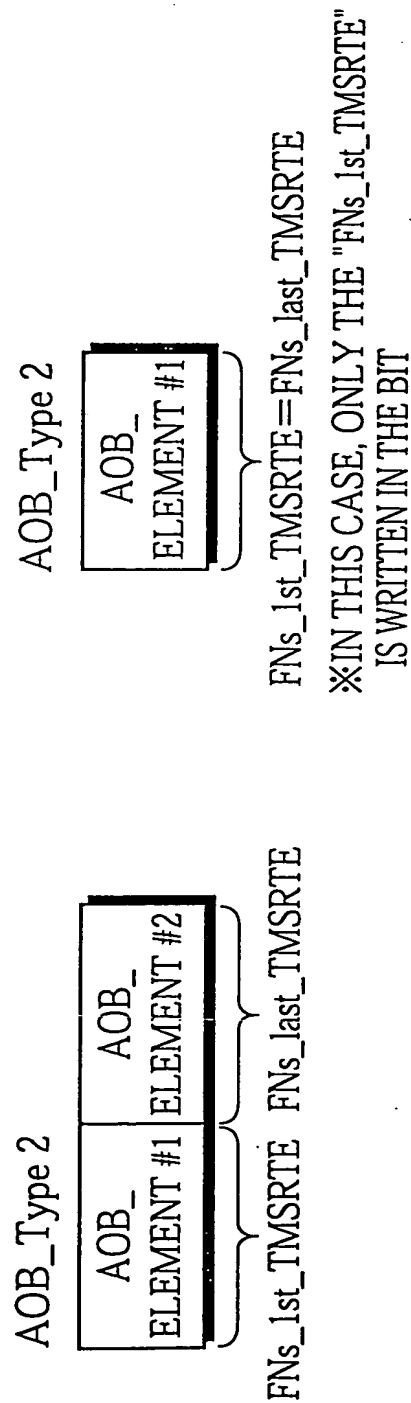


FIG. 31A

FIG. 31A  
PATTERN WHERE COMBINING OF AOBs POSSIBLE

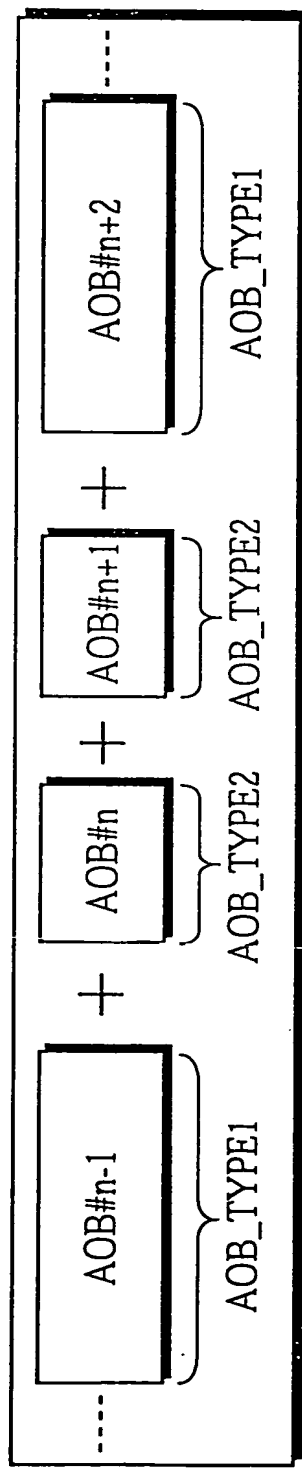


FIG. 31B  
PATTERN WHERE COMBINING OF AOBs NOT POSSIBLE

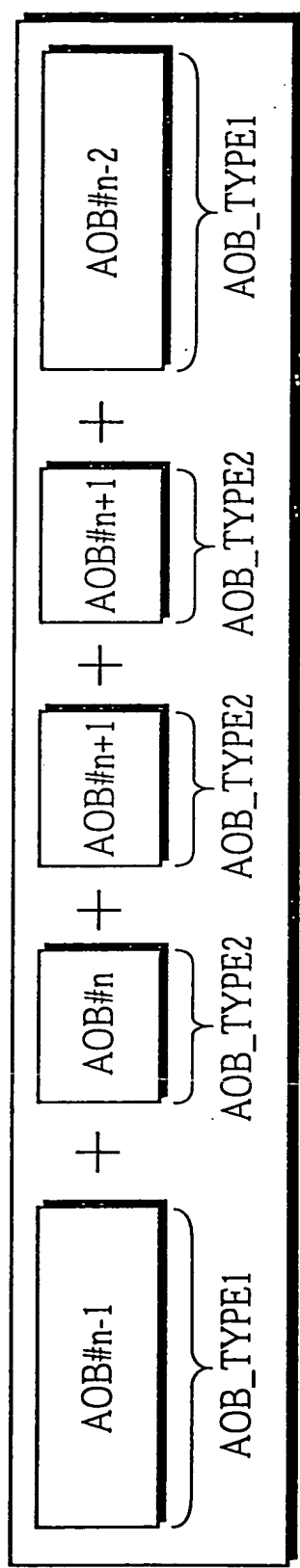


FIG. 32A

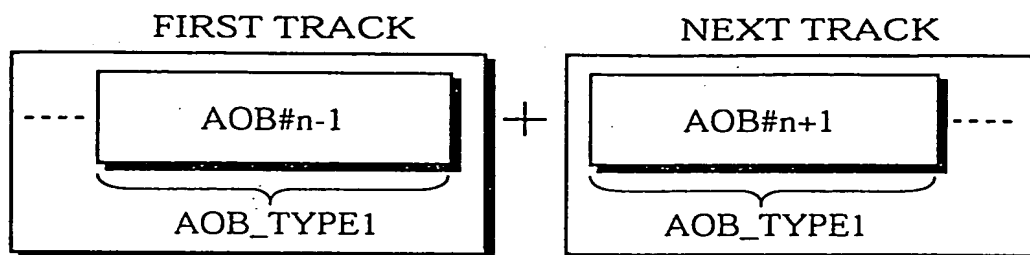


FIG. 32B

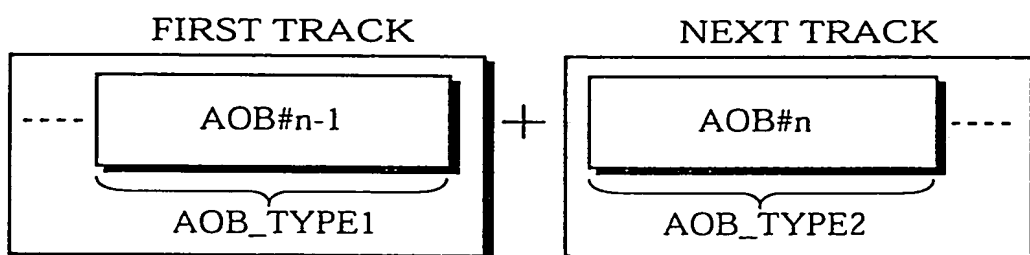


FIG. 32C

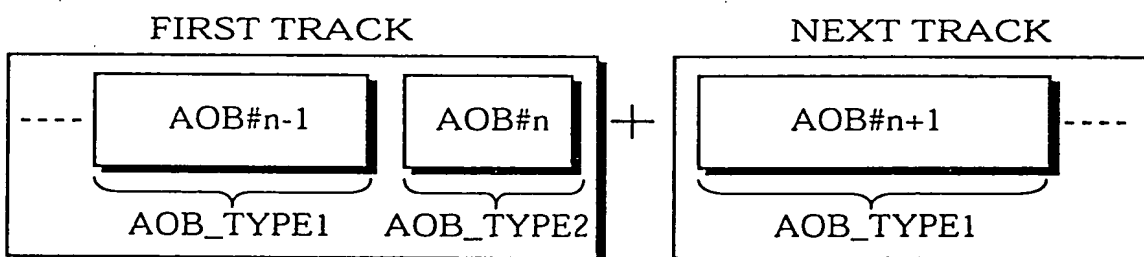


FIG. 32D

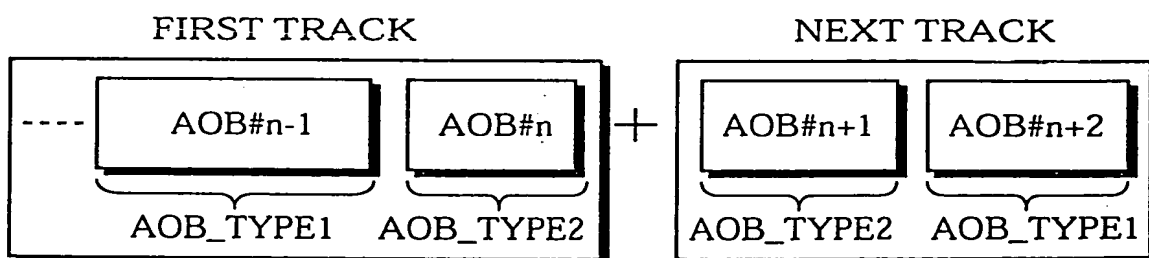


FIG. 32E

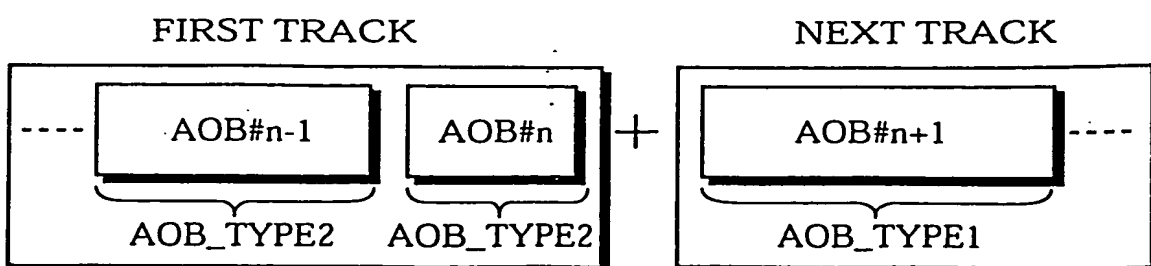




FIG. 33A DIVISION OF Track C INTO Track C AND Track F(case 4)

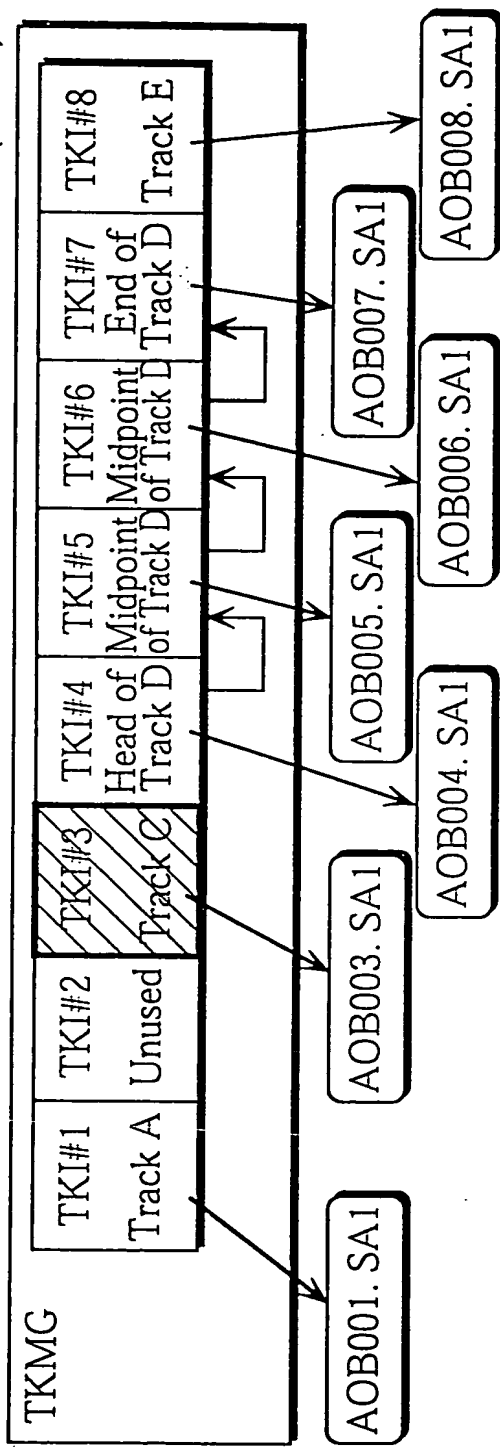
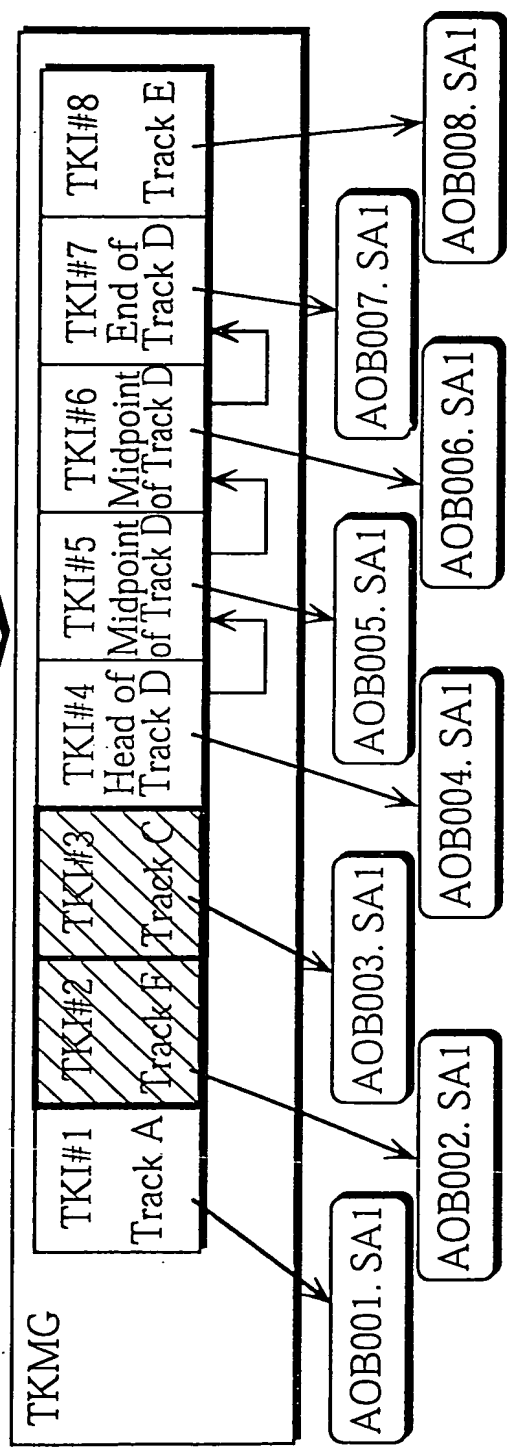


FIG. 33B





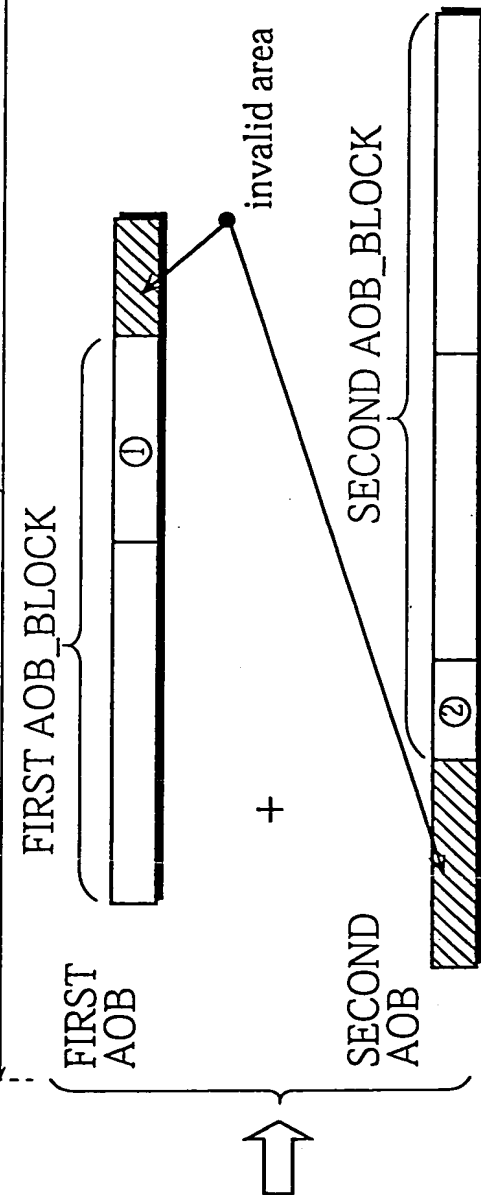
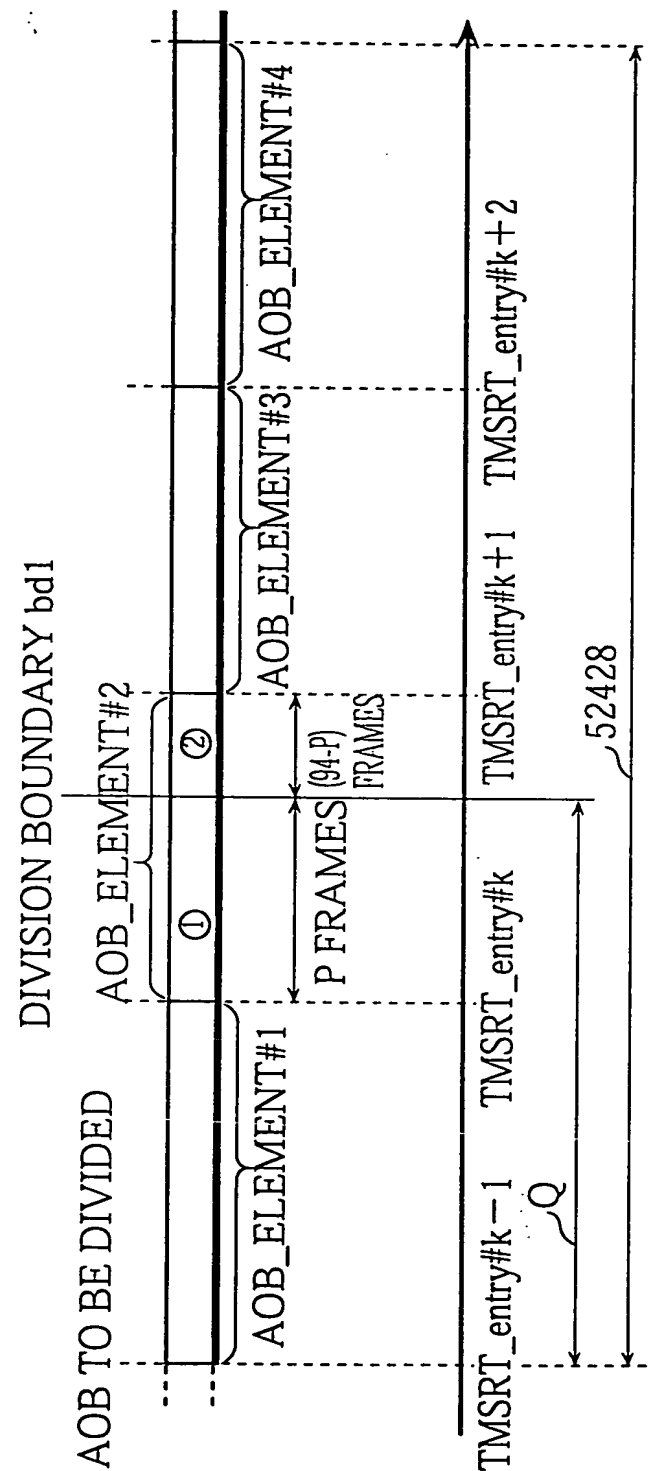


FIG. 36

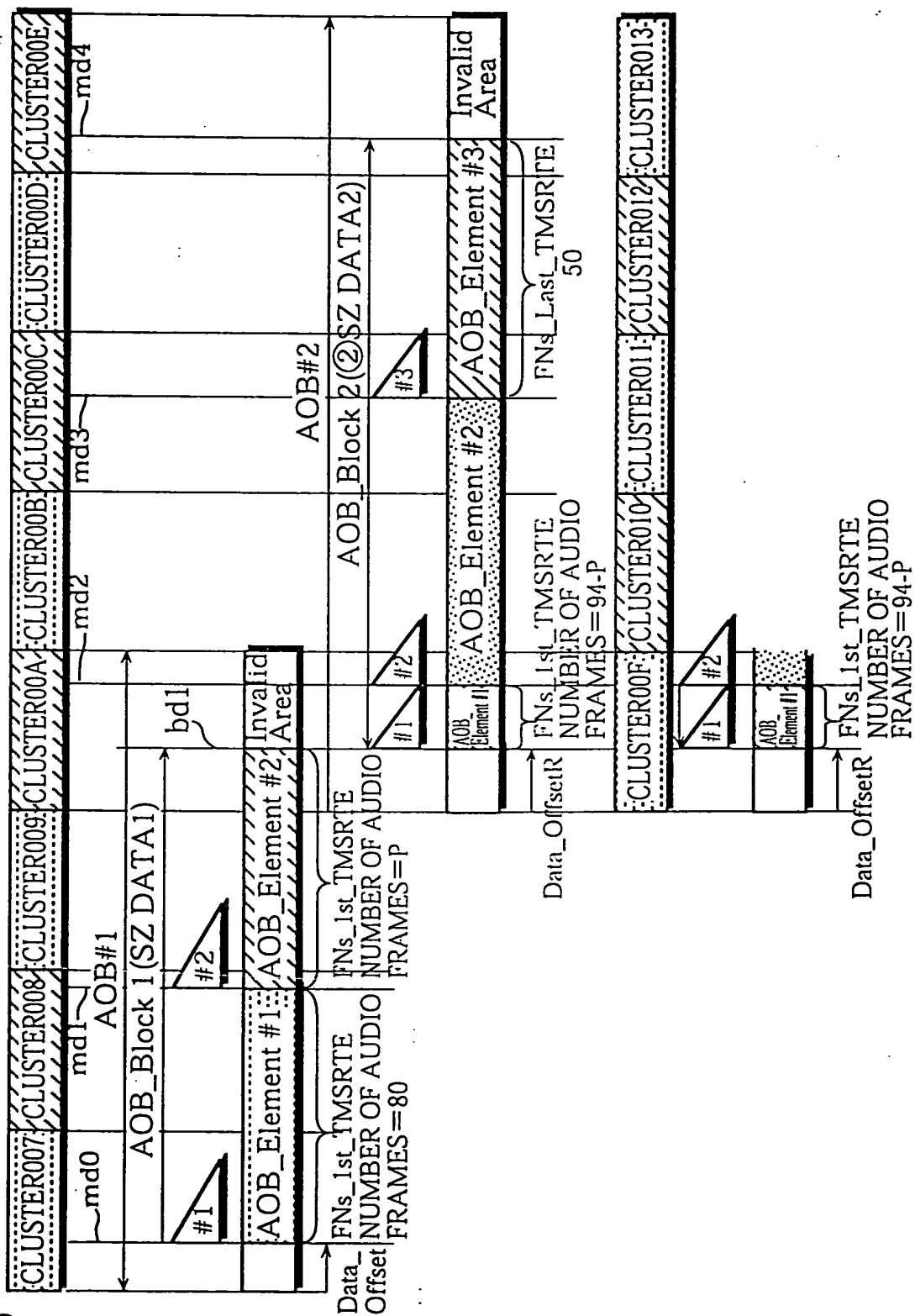


FIG. 37

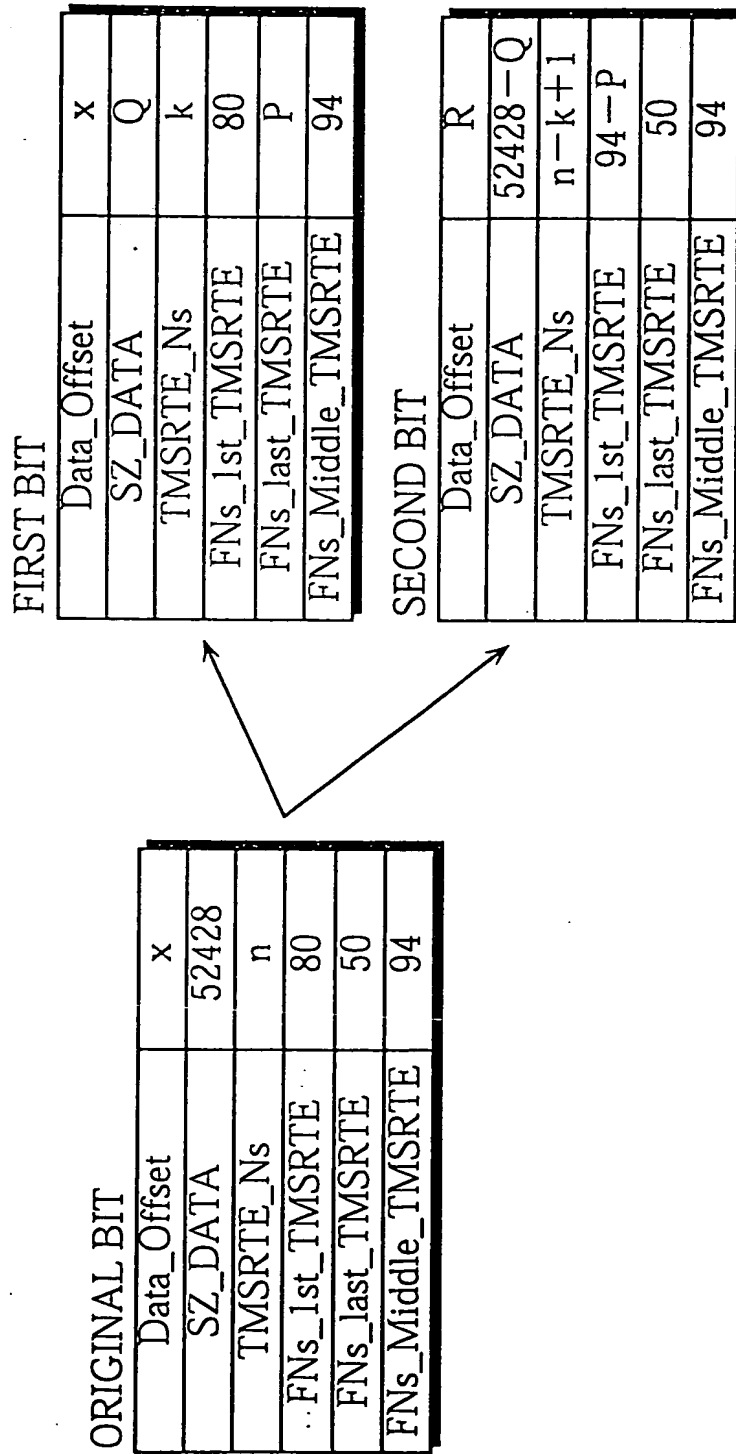




FIG. 39A

ATTRIBUTES OF DPL\_TK\_ATR

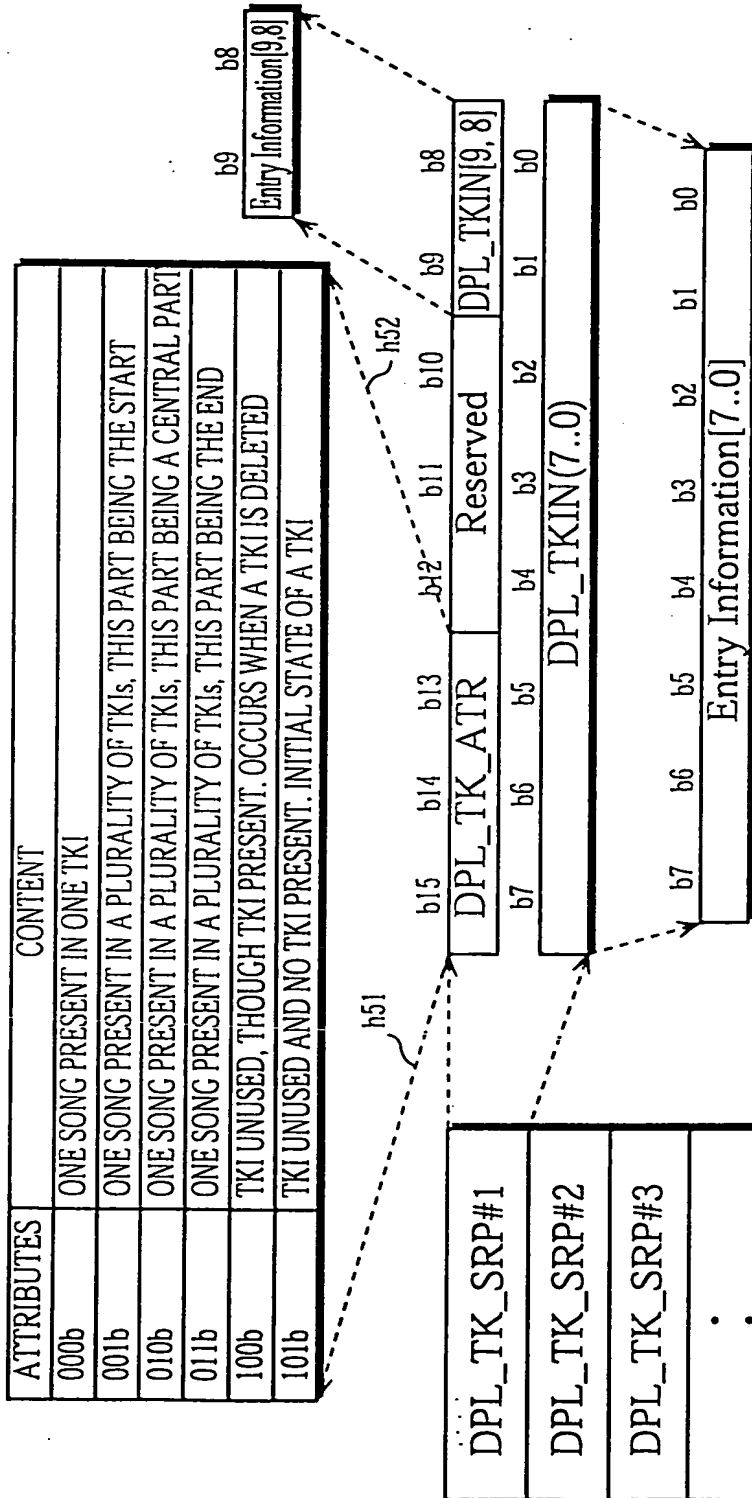


FIG. 39B

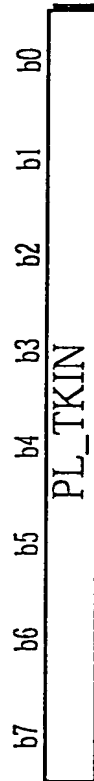


FIG. 40

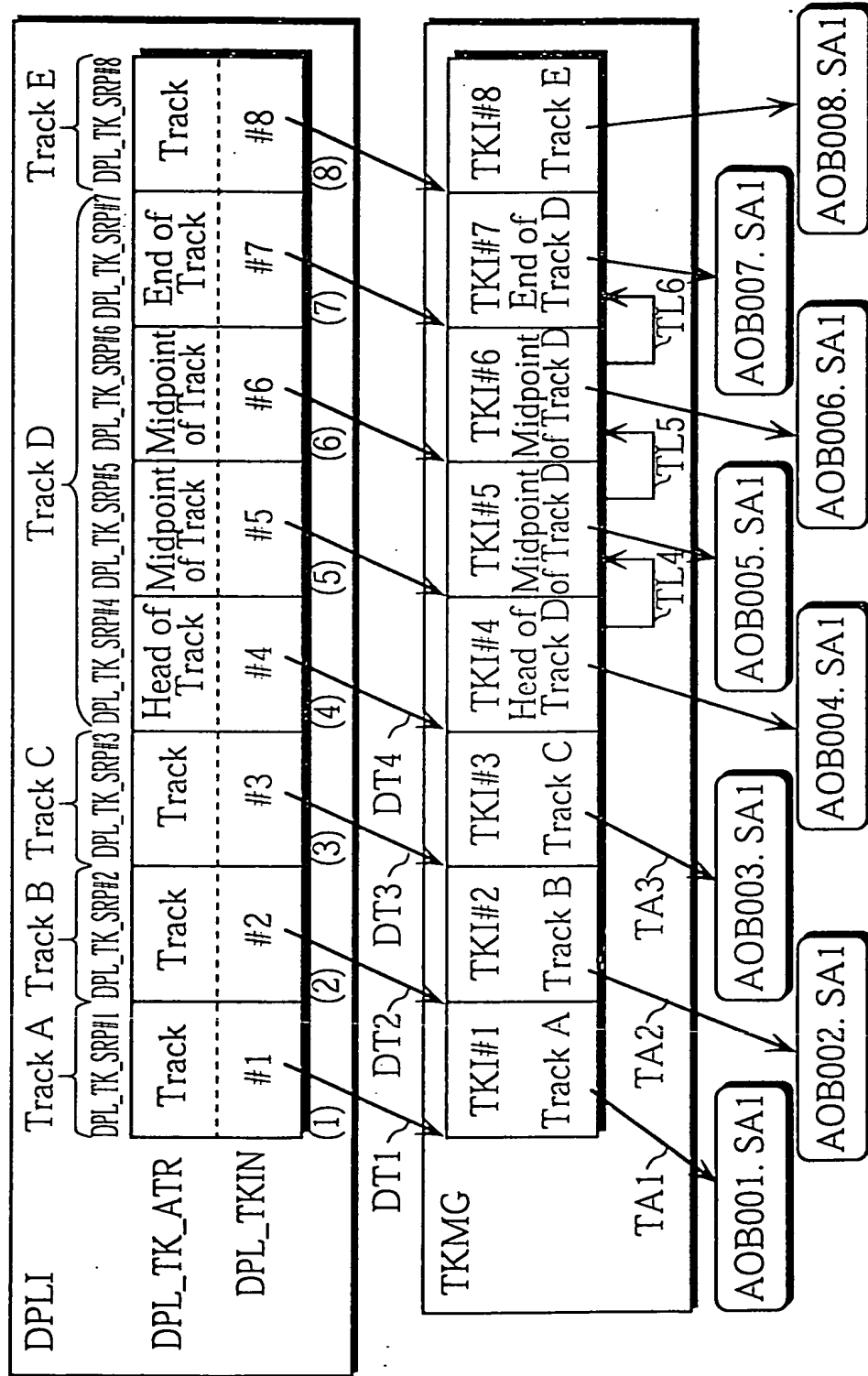




FIG. 41

DPLI	Track A			Track B		Track C		Track D			Track E	
	DPL_TK_SRP#1		DPL_TK_SRP#2		DPL_TK_SRP#3		DPL_TK_SRP#4		DPL_TK_SRP#5		DPL_TK_SRP#6 DPL_TK_SRP#7 DPL_TK_SRP#8	
	Track	Track	Track	Track	Head of Track	Midpoint of Track	Midpoint of Track	Midpoint of Track	End of Track	Track	Track	
DPL_TK_ATR	#1	#2	#3	#4	#5	#6	#7	#8				
DPL_TKIN												
....												

FIG. 42

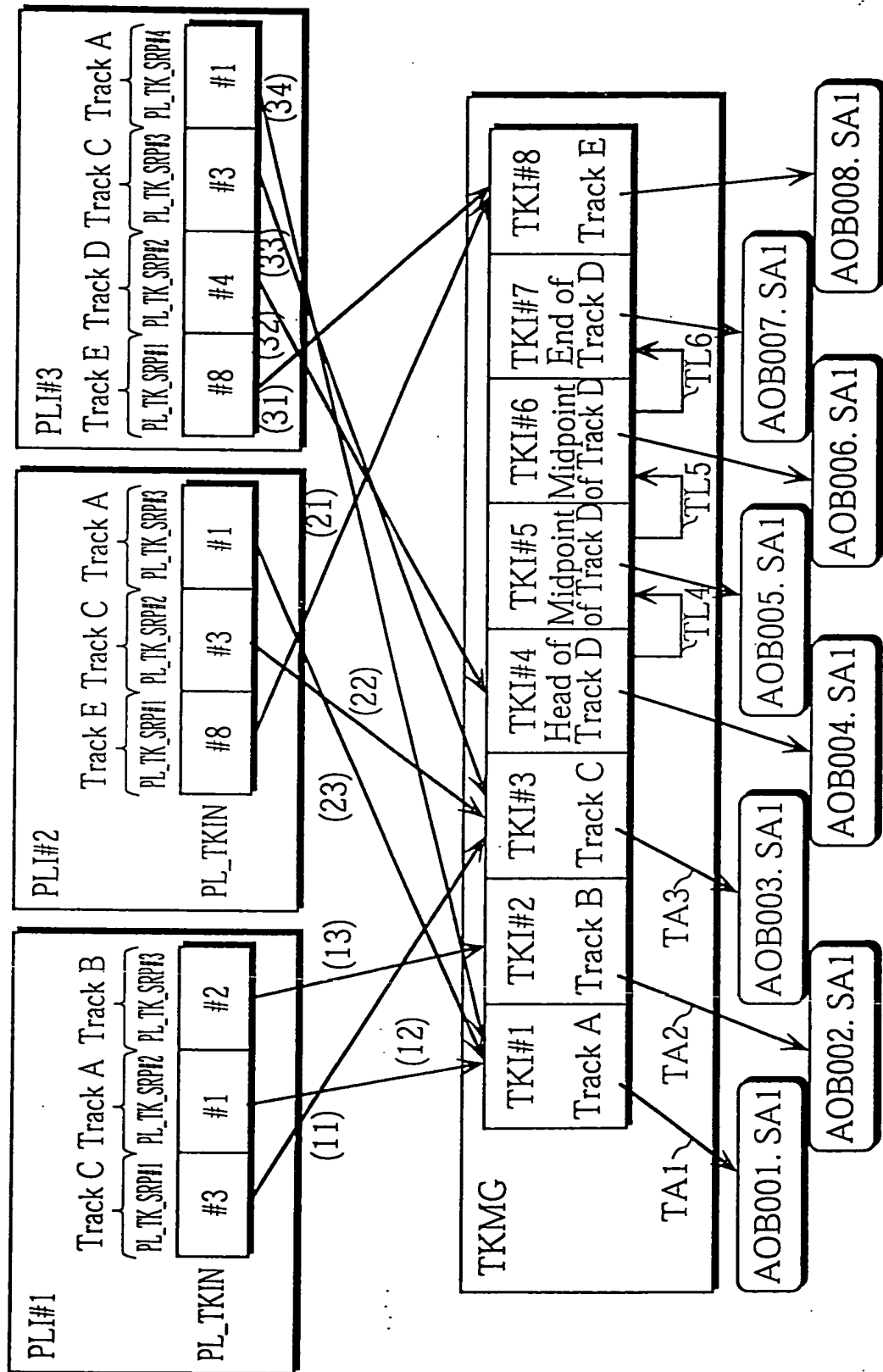


FIG. 43A

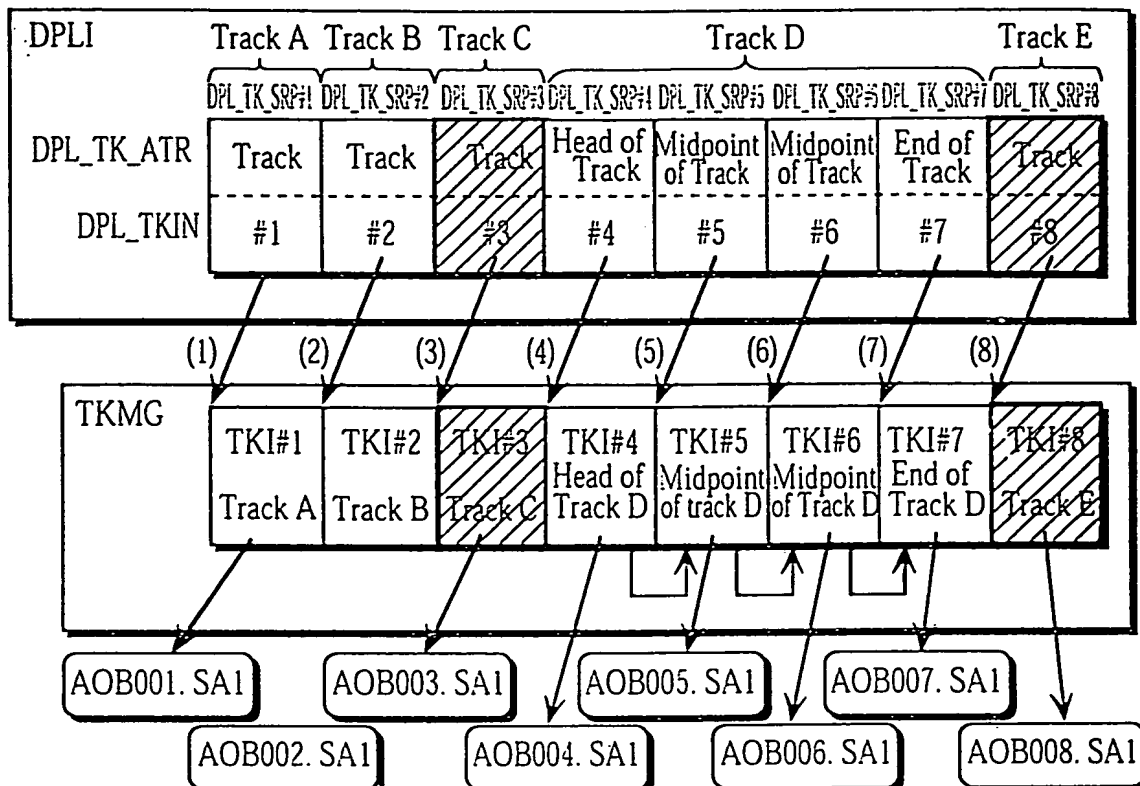


FIG. 43B

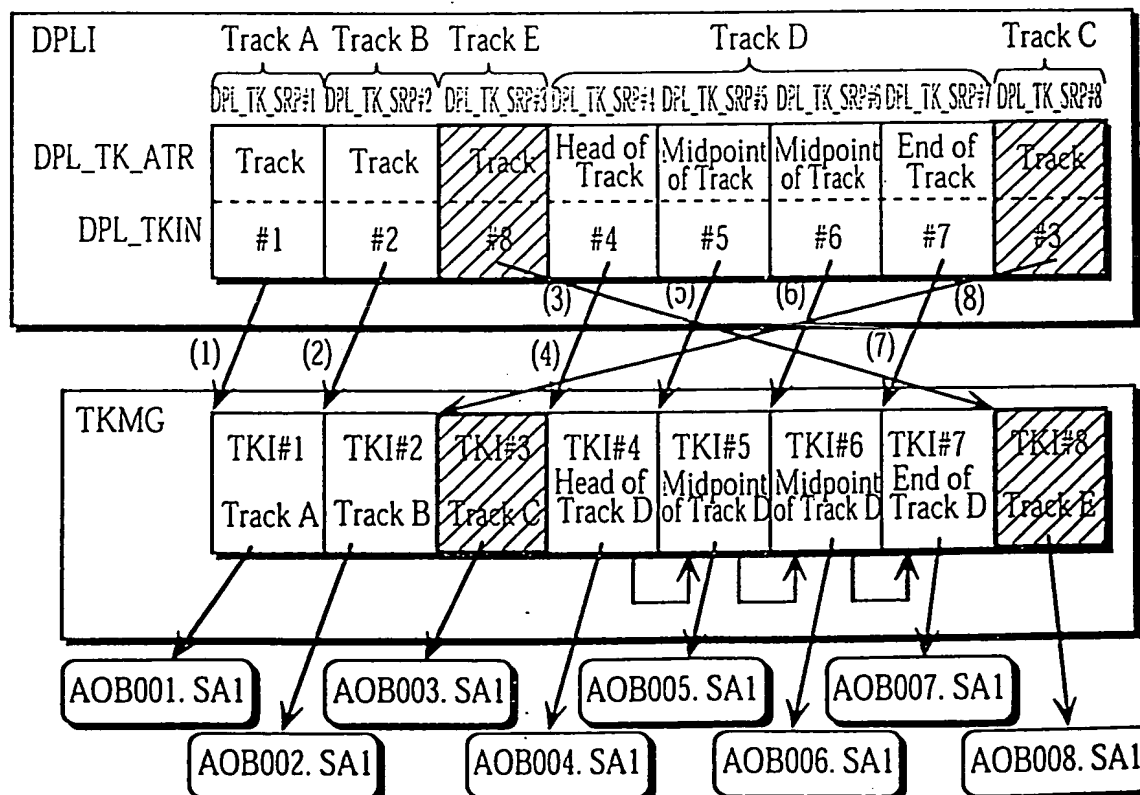


FIG. 44A

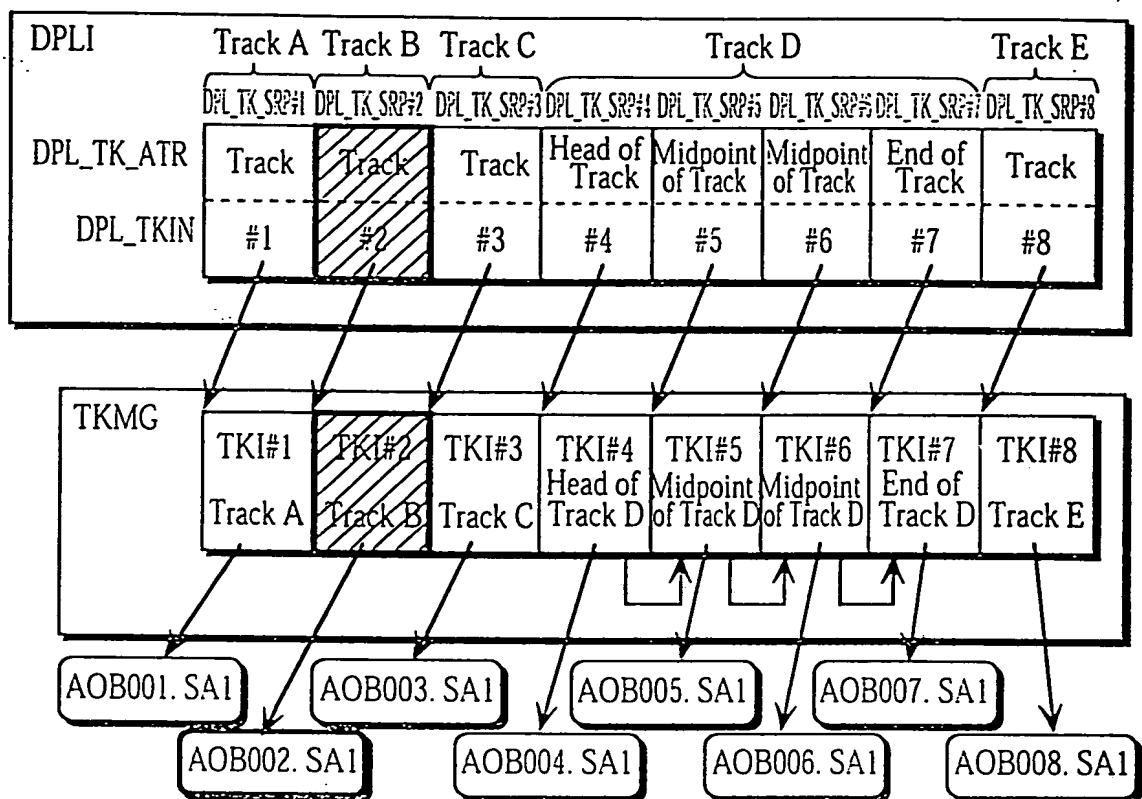


FIG. 44B

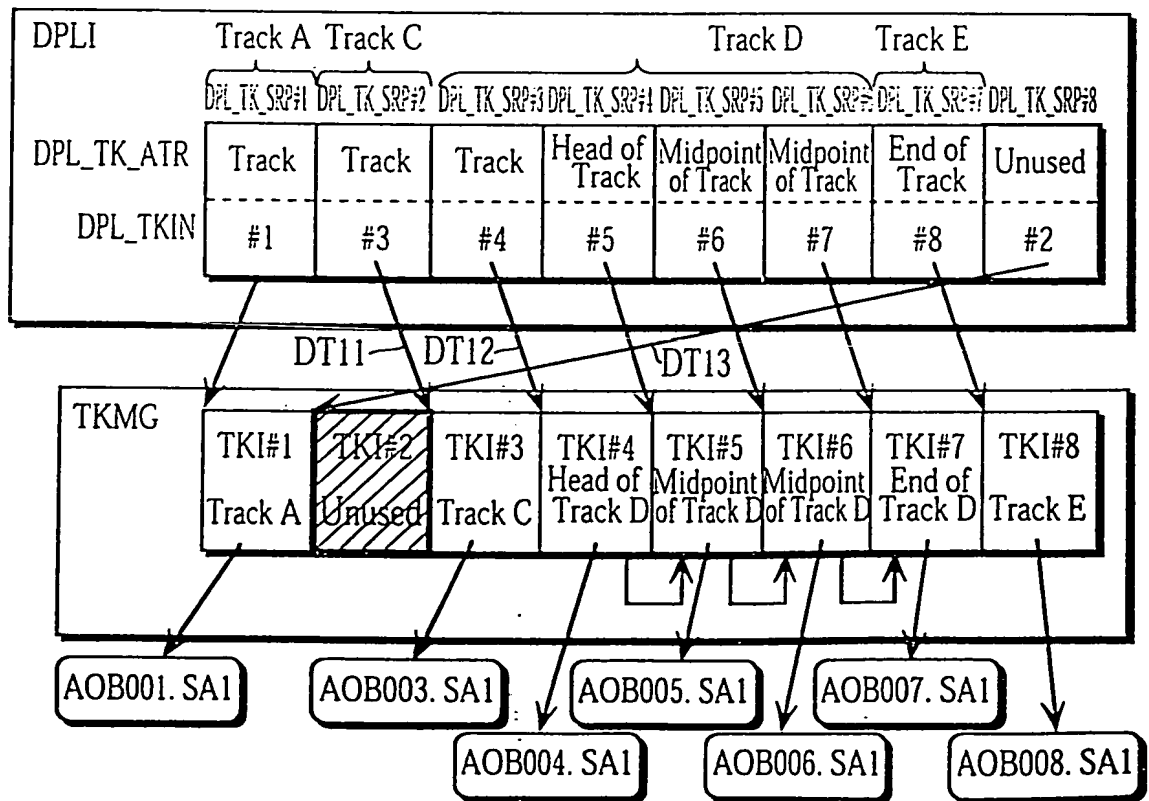


FIG. 45A

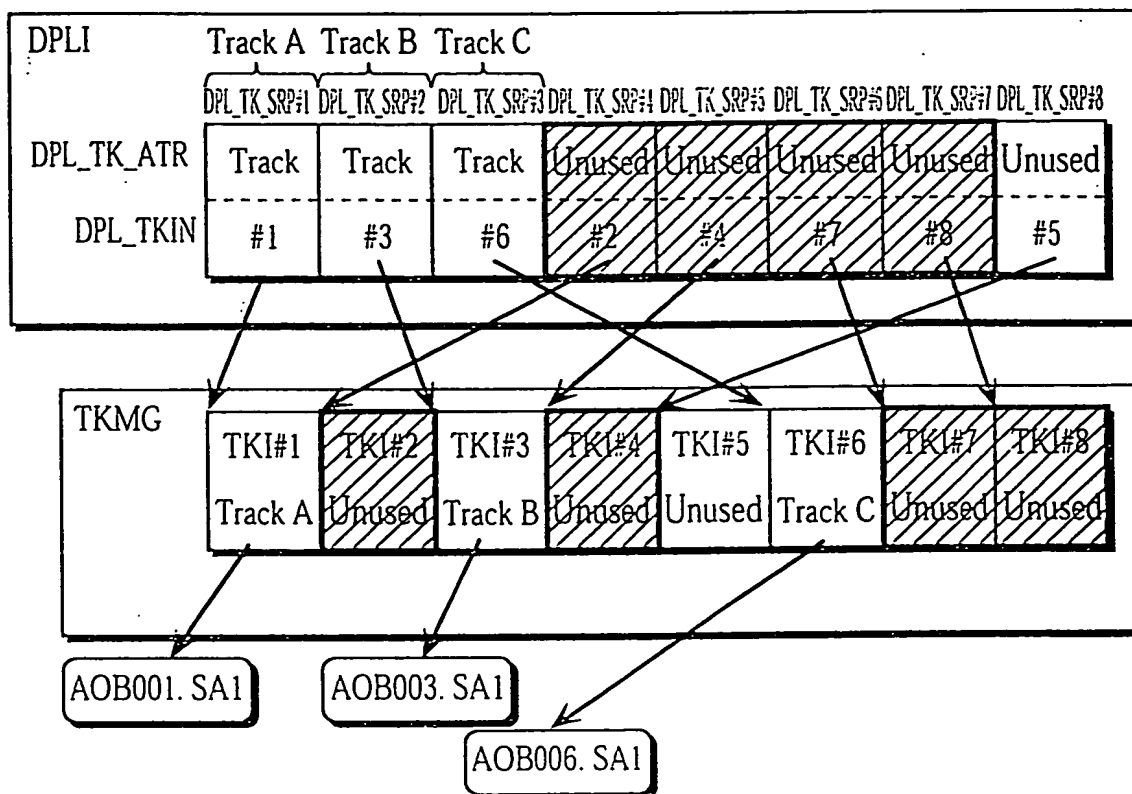


FIG. 45B

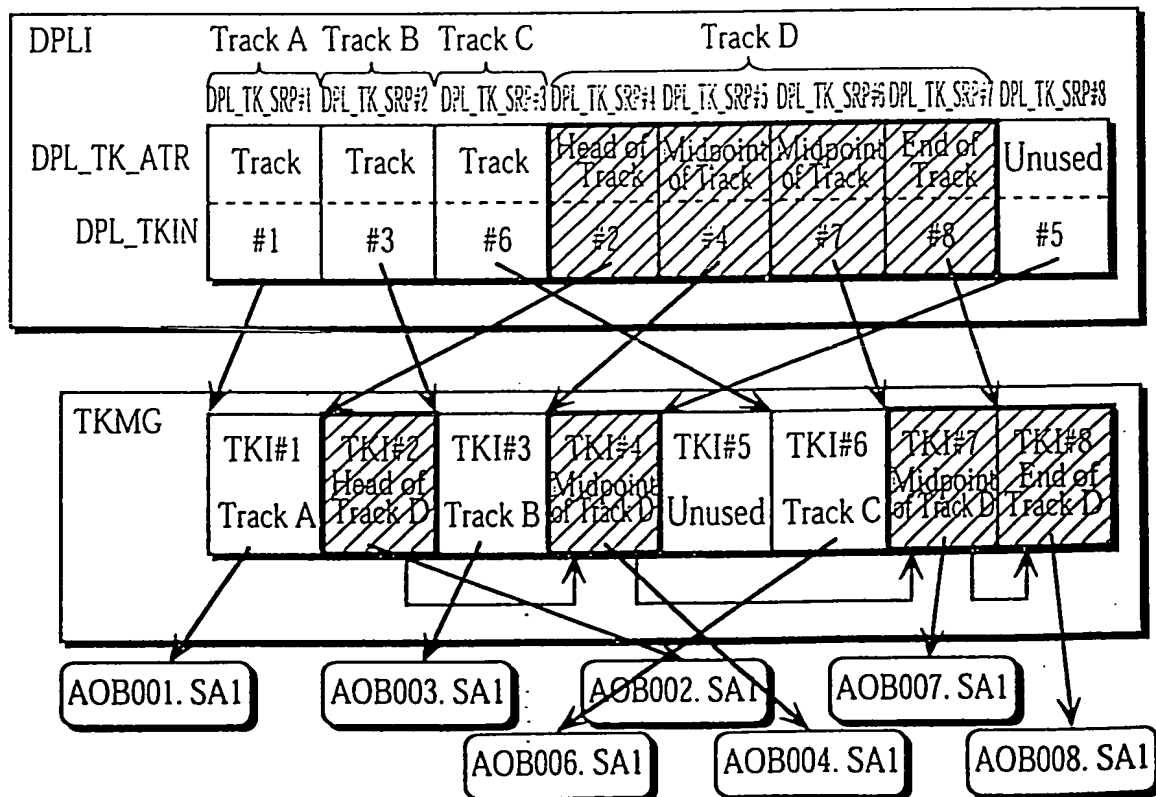


FIG. 46A

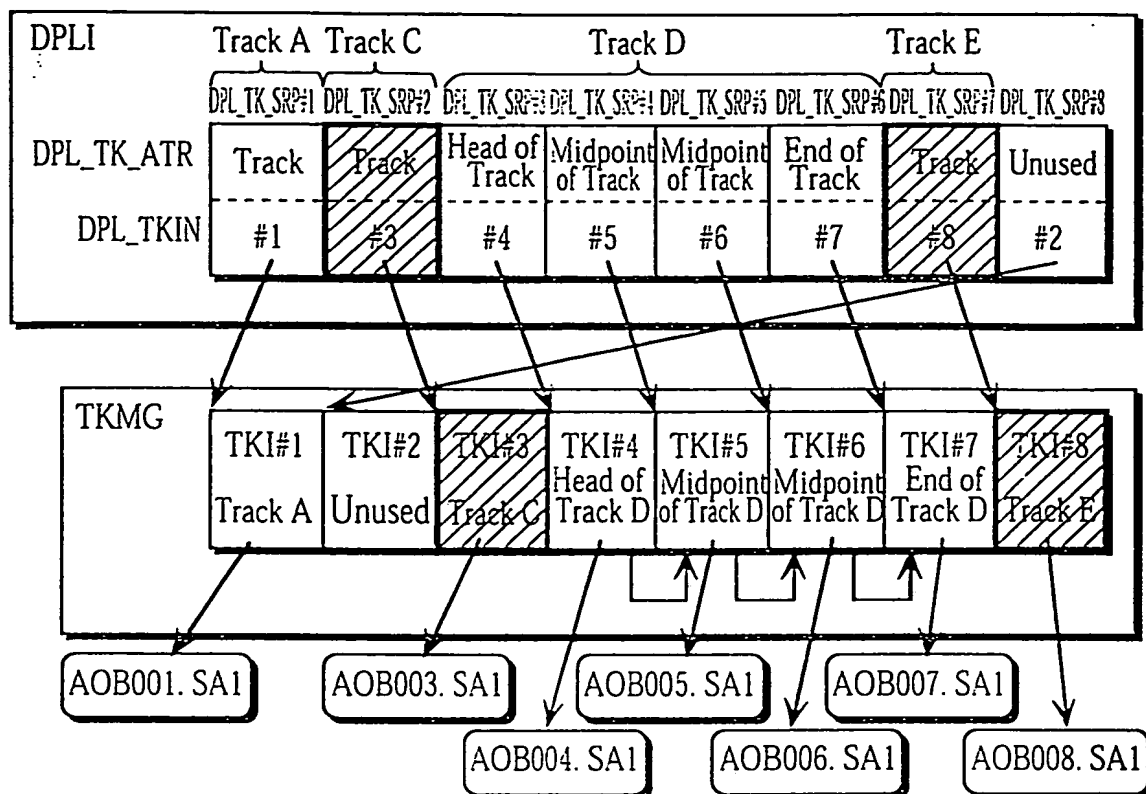


FIG. 46B

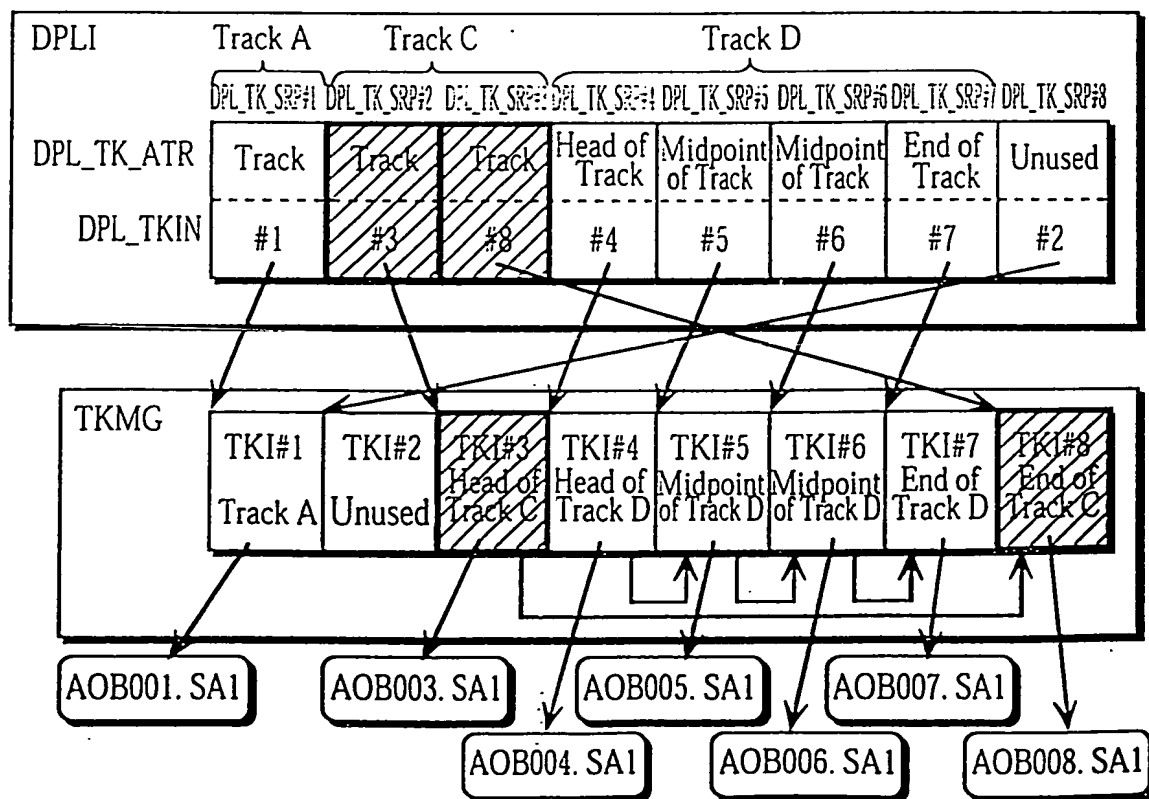


FIG. 47A

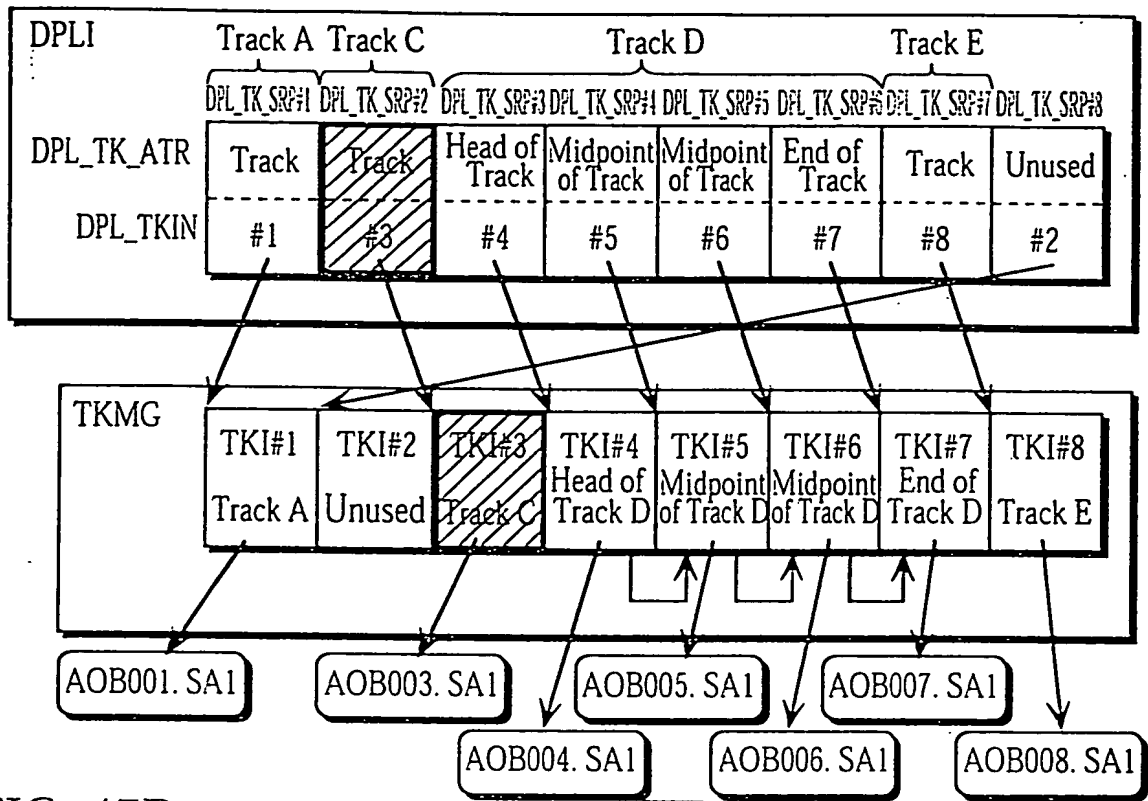


FIG. 47B

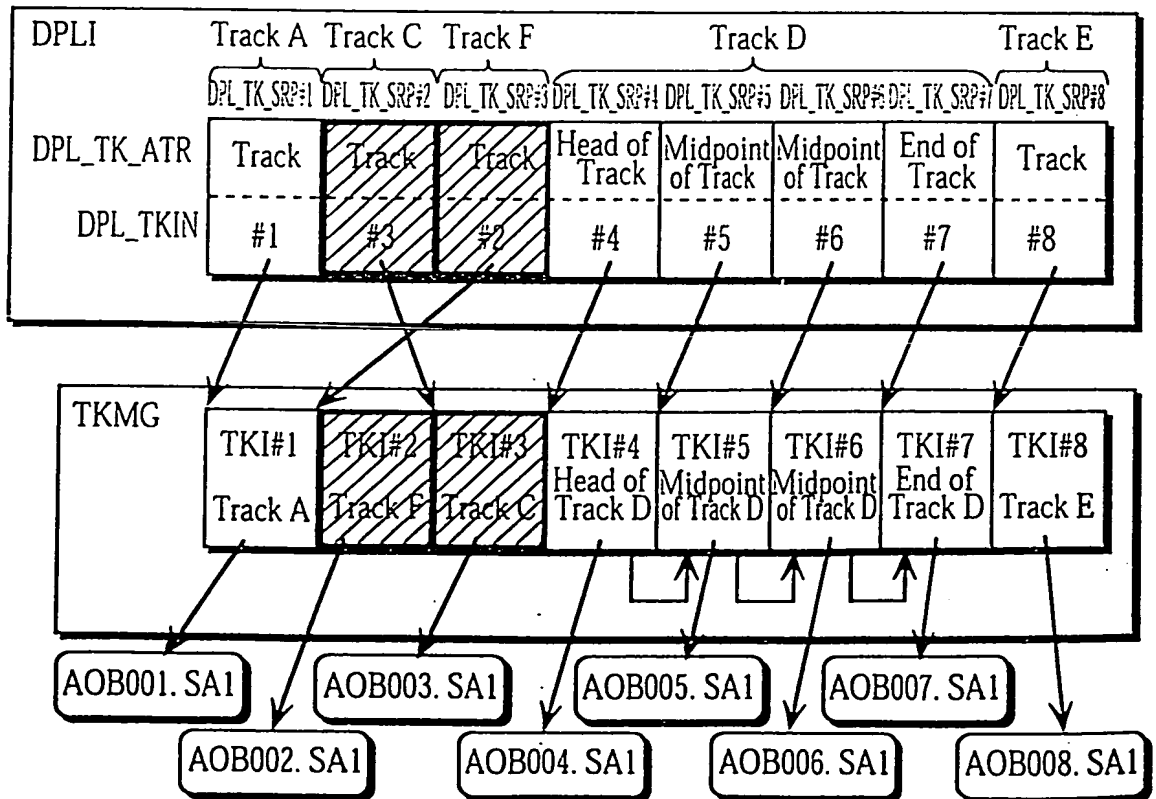


FIG. 48

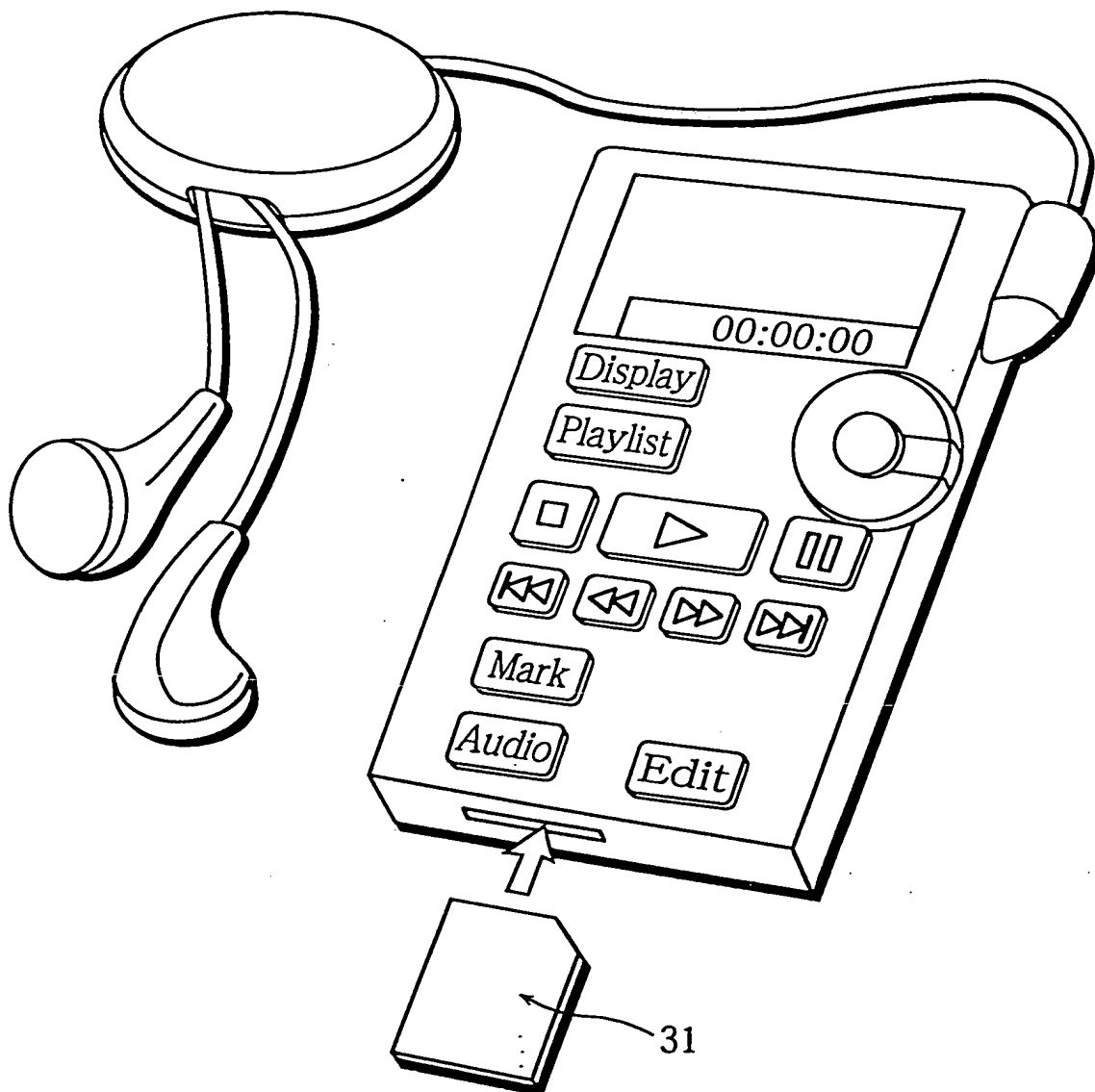




FIG. 49

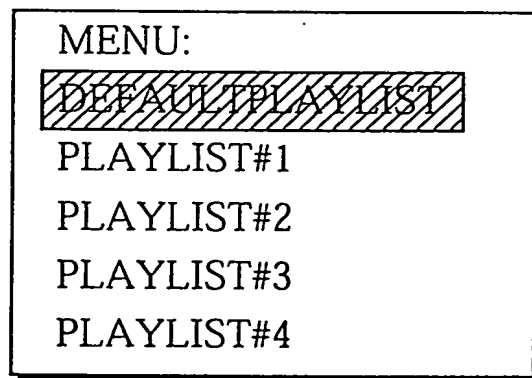


FIG. 50A

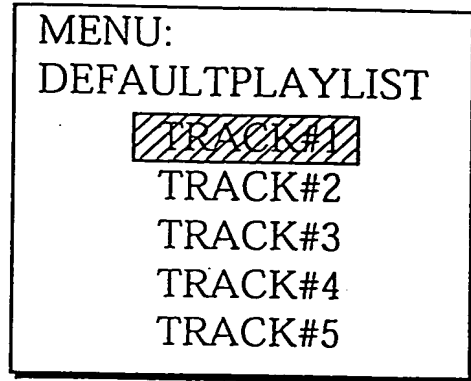


FIG. 50B

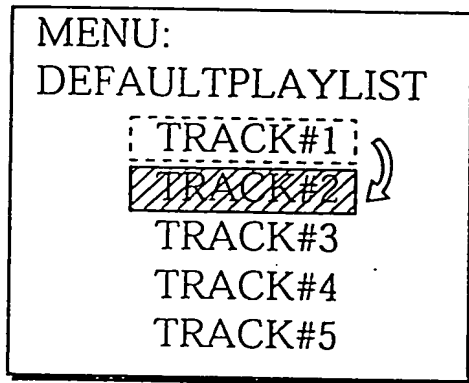


FIG. 50C

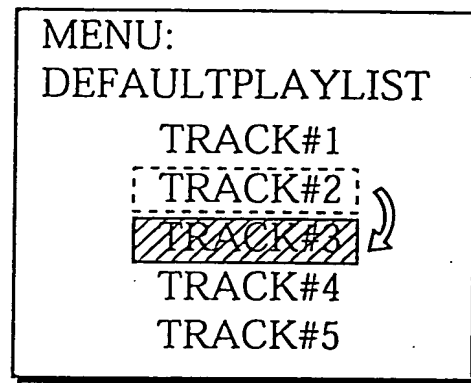


FIG. 50D

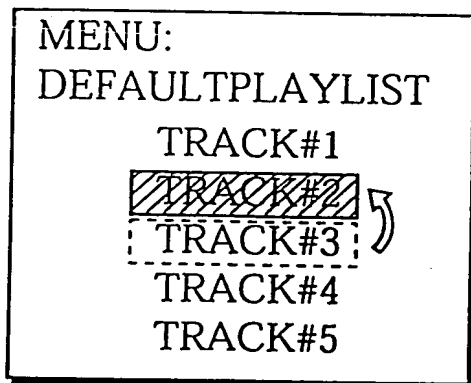
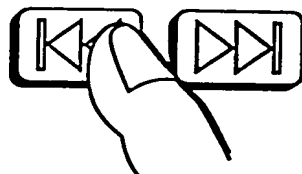
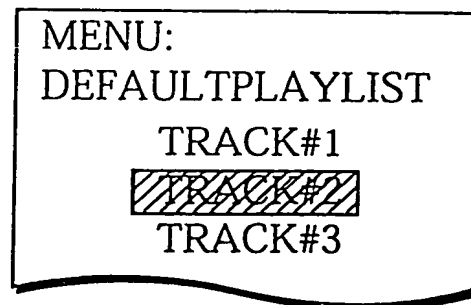


FIG. 50E



PLAY

...INDICATES THAT TRACK#2 SHOULD BE PLAYED BACK

Playlist

...INDICATES THAT TRACK#2 SHOULD BE EDITED

FIG. 51A

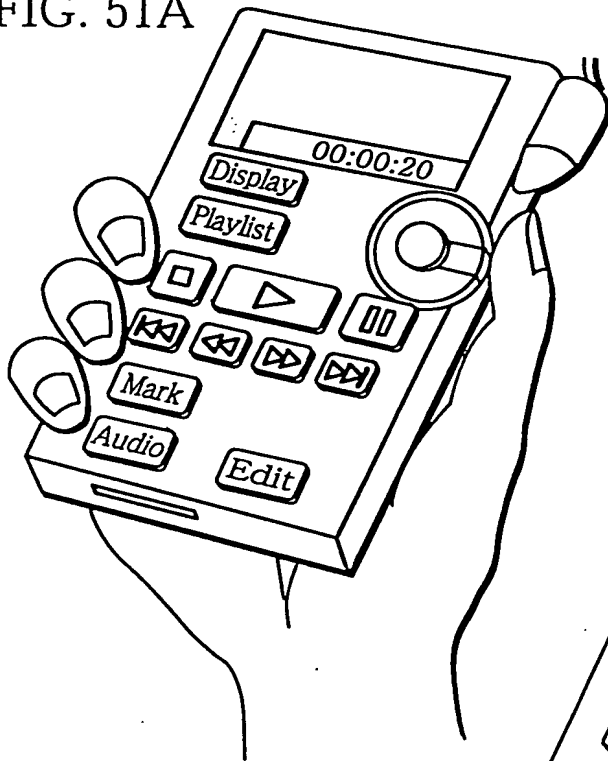


FIG. 51C

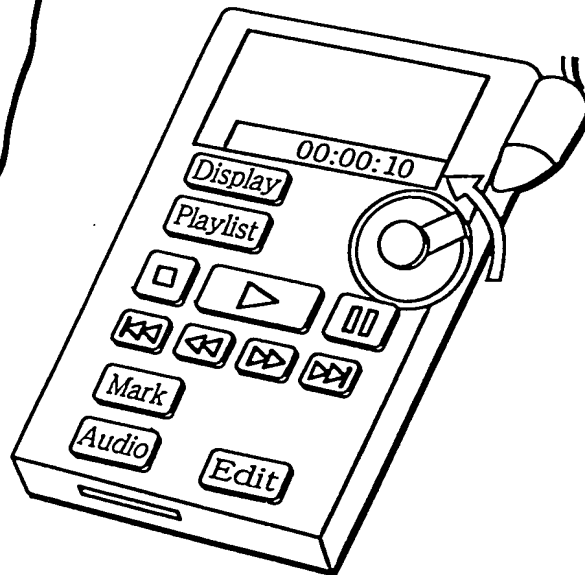
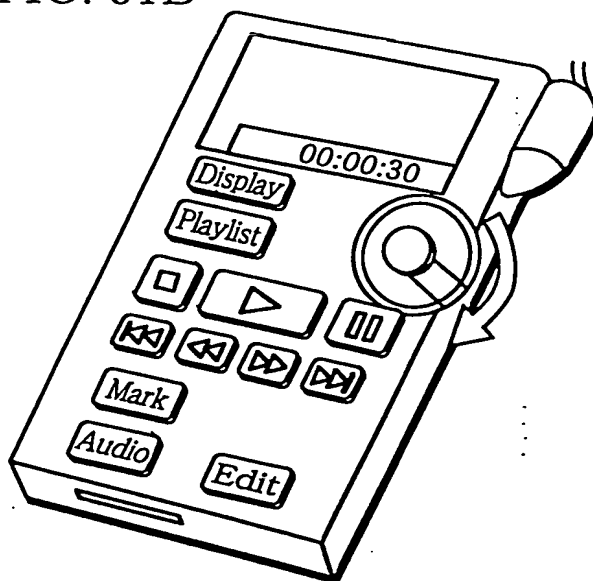


FIG. 51B



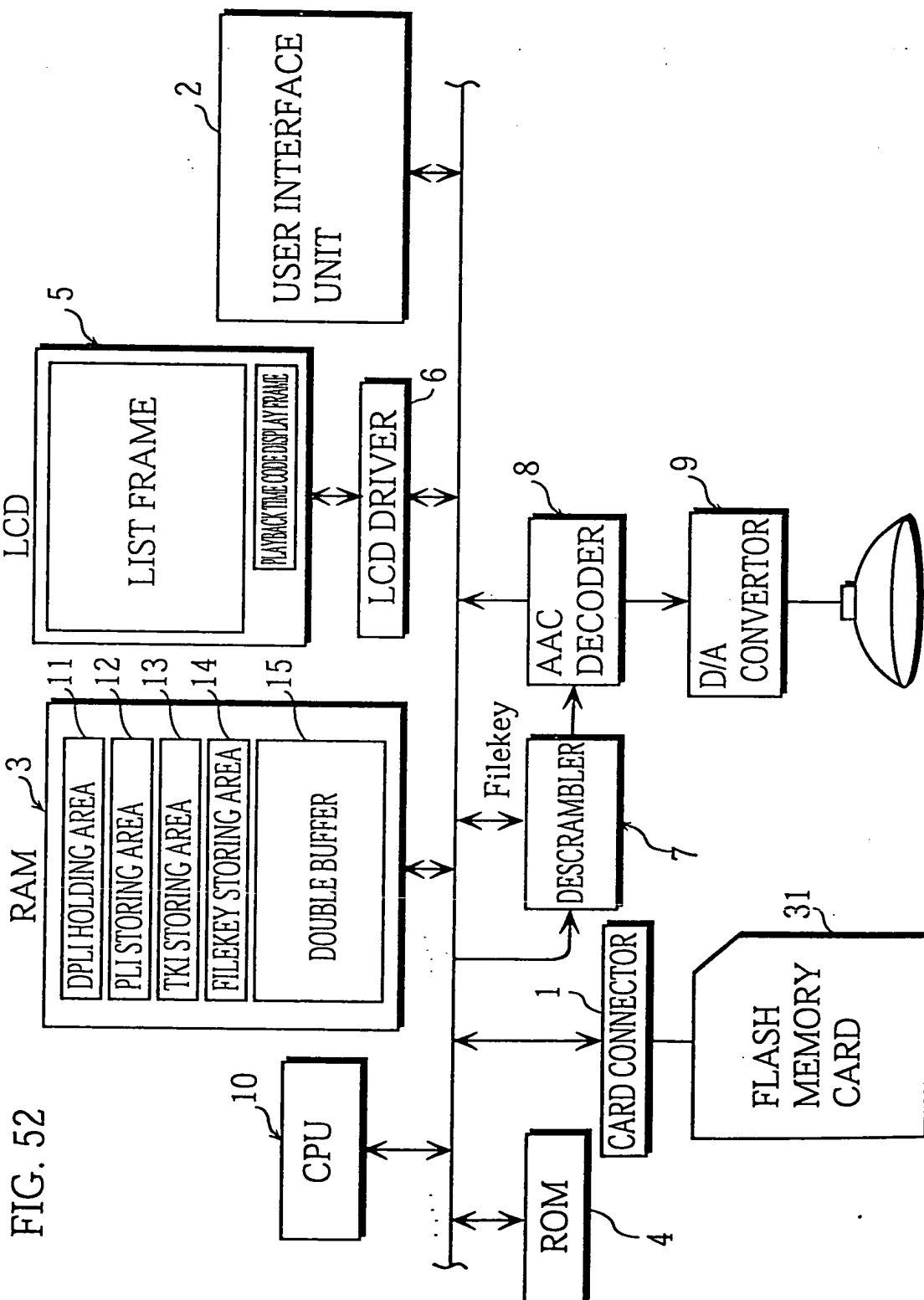


FIG. 52

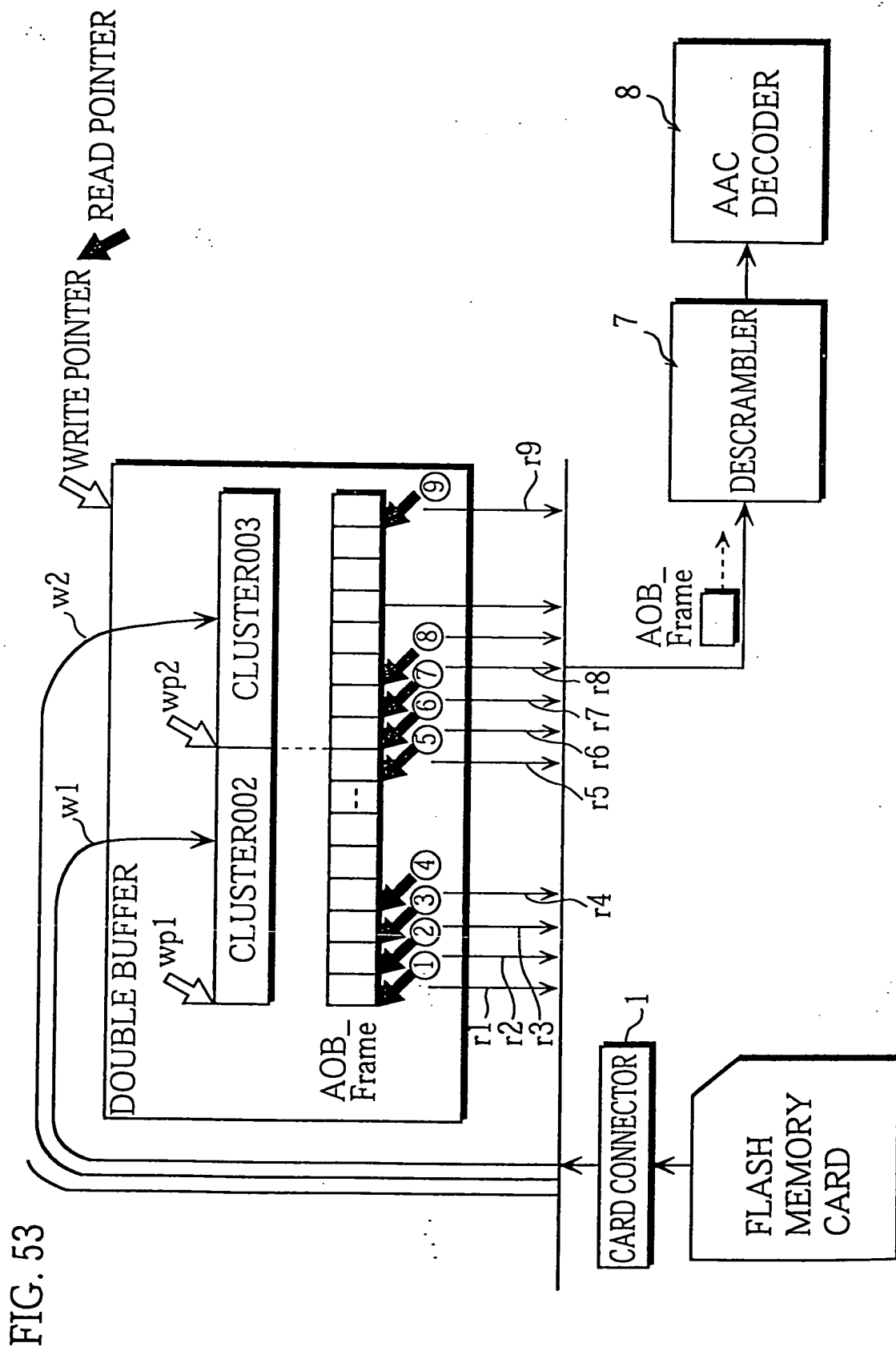


FIG. 54A

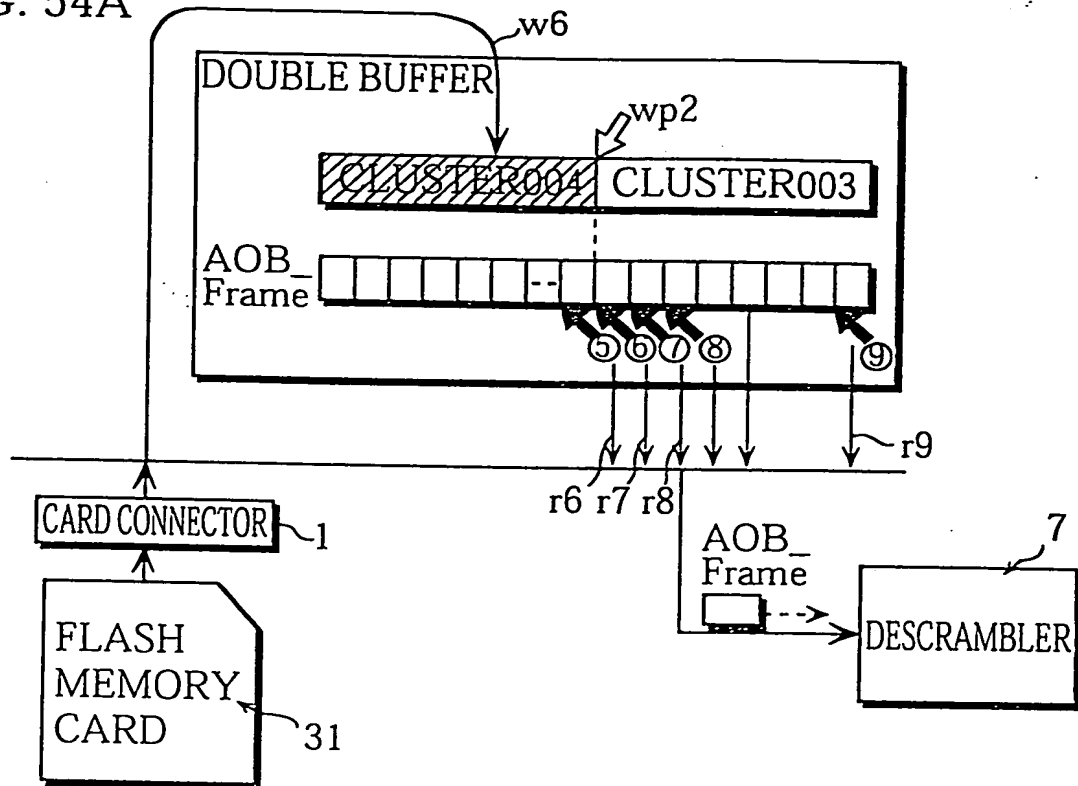


FIG. 54B

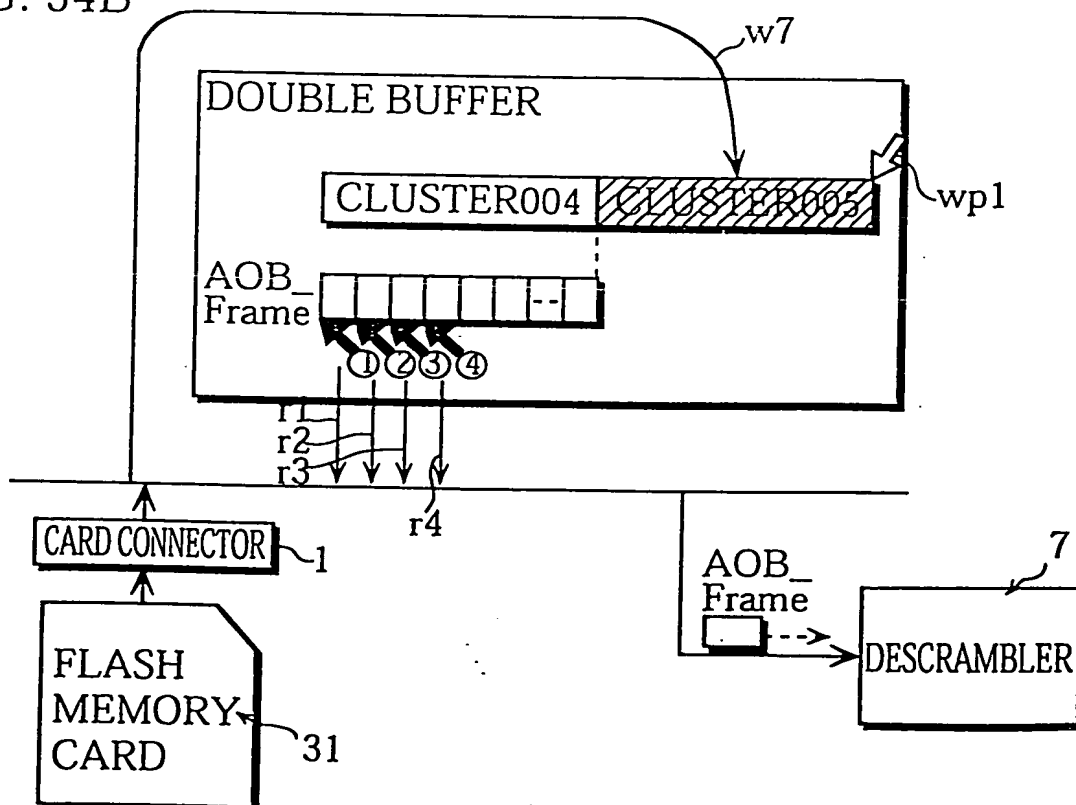


FIG. 55

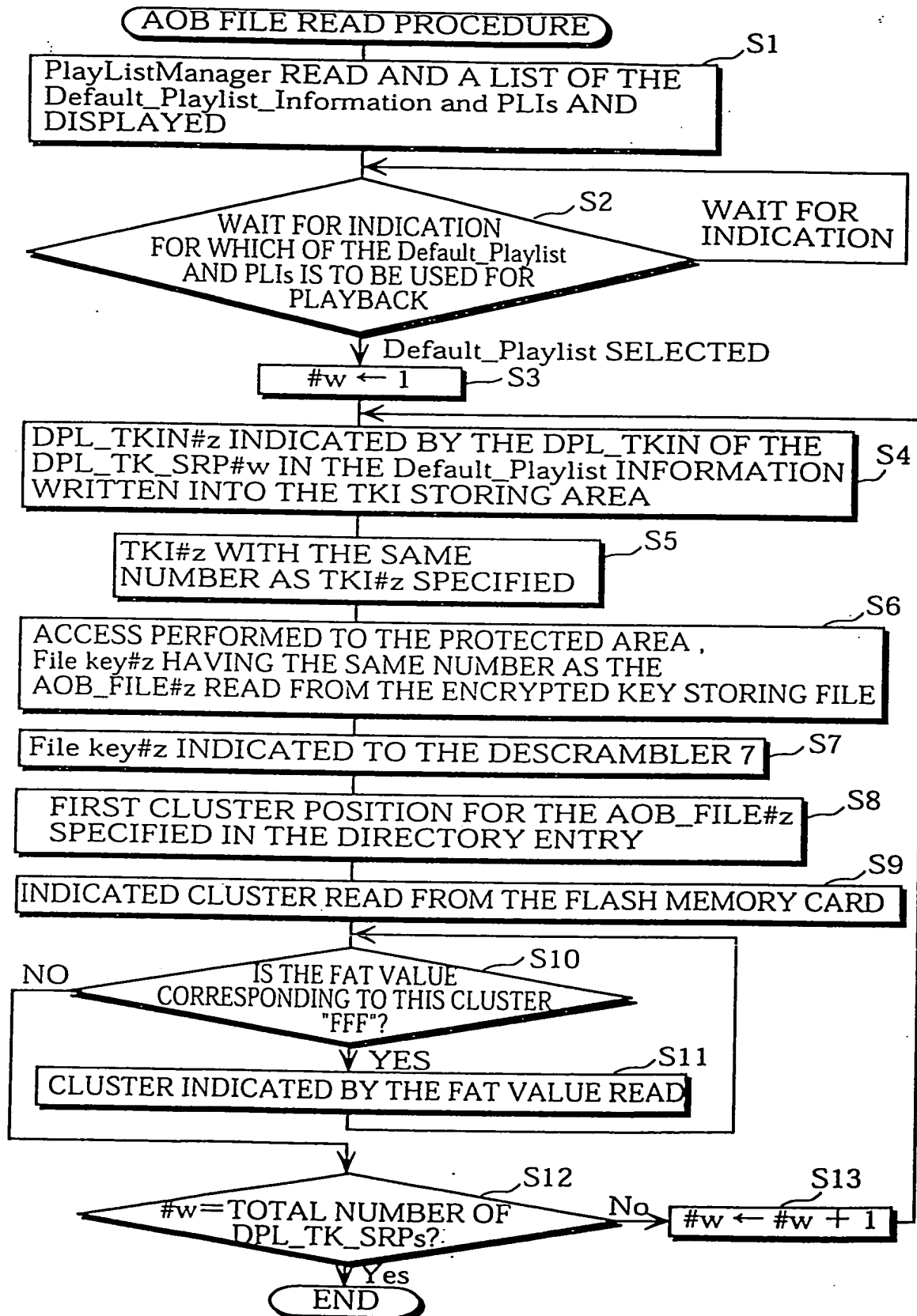


FIG. 56

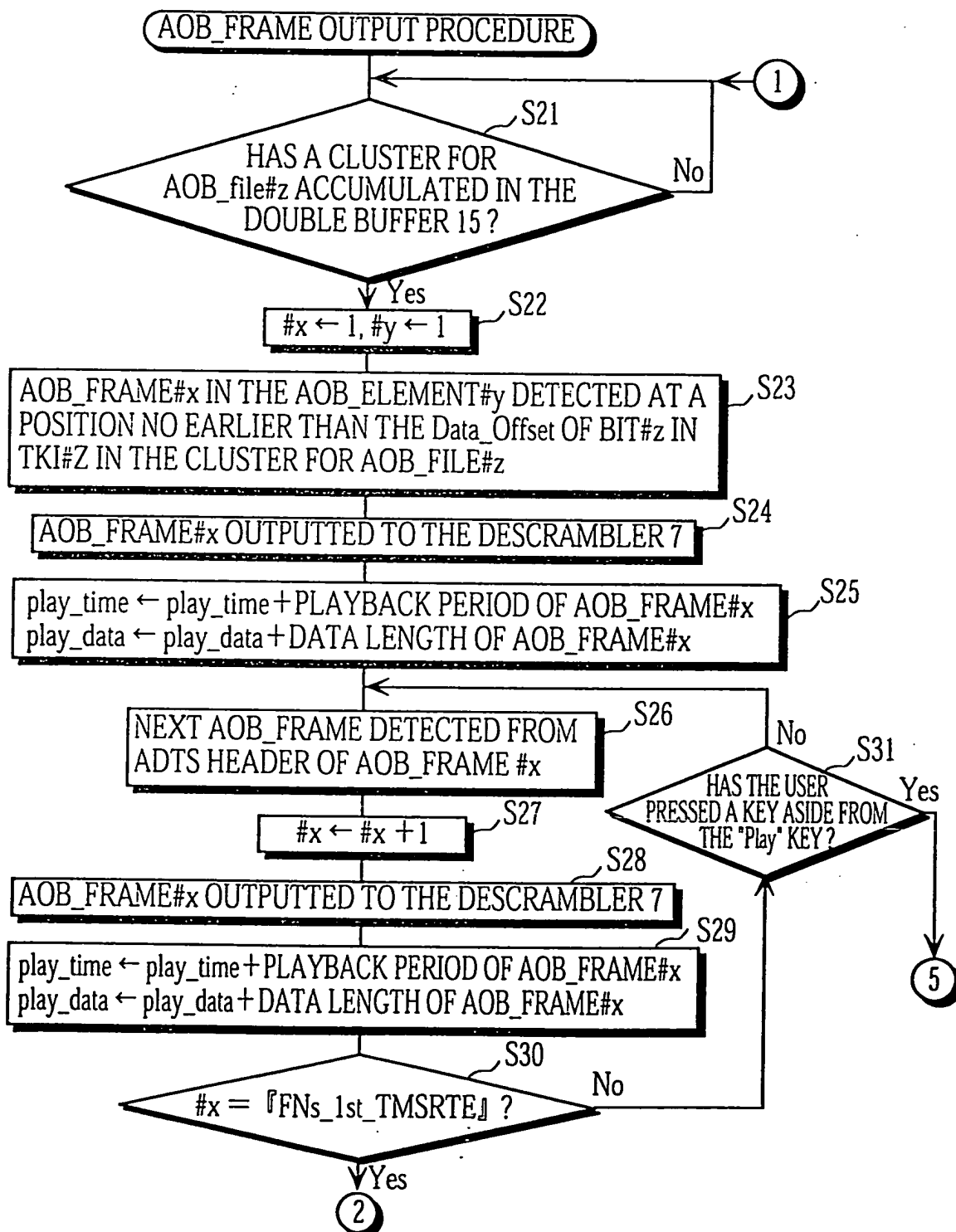




FIG. 57

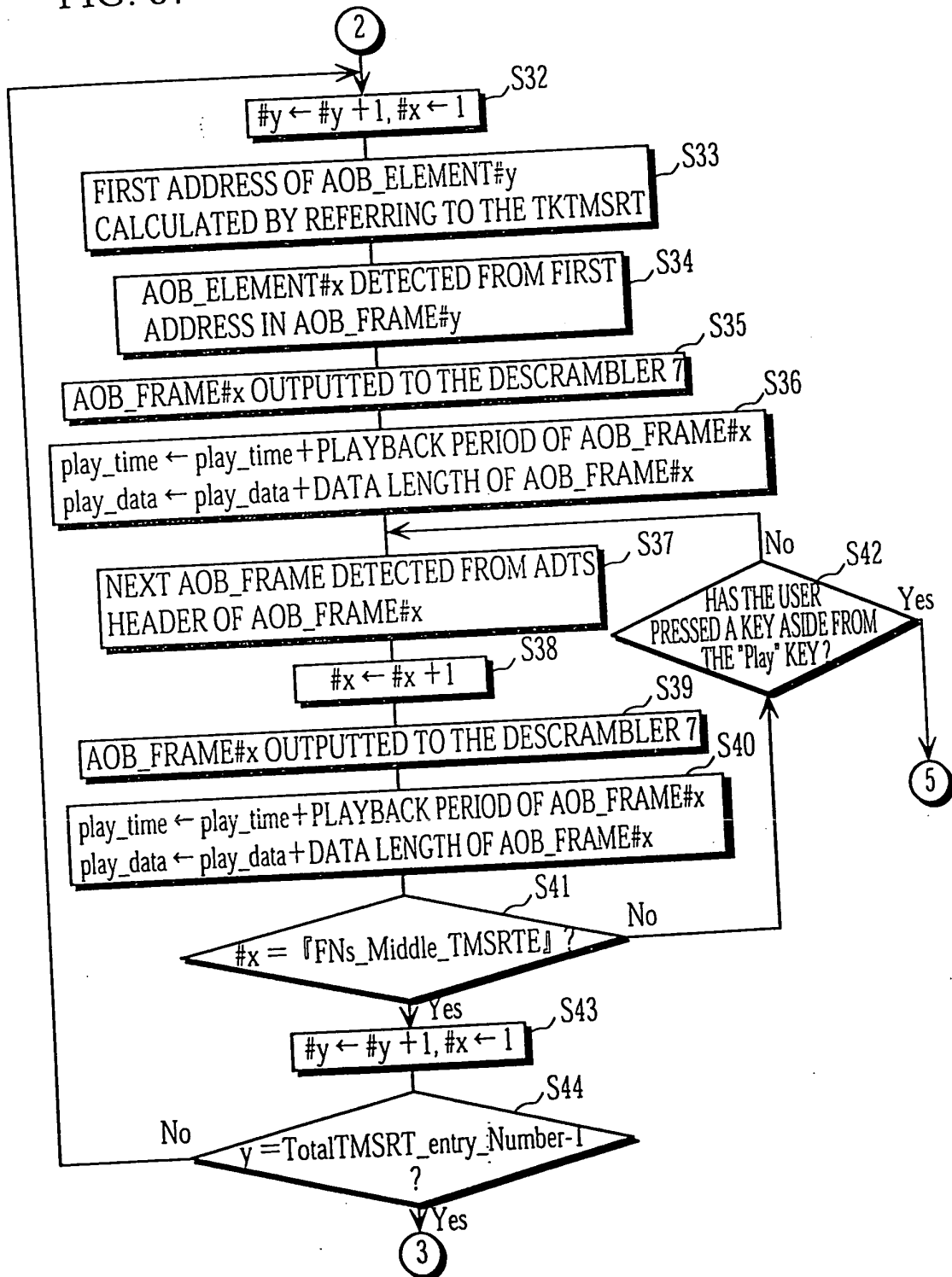


FIG. 58

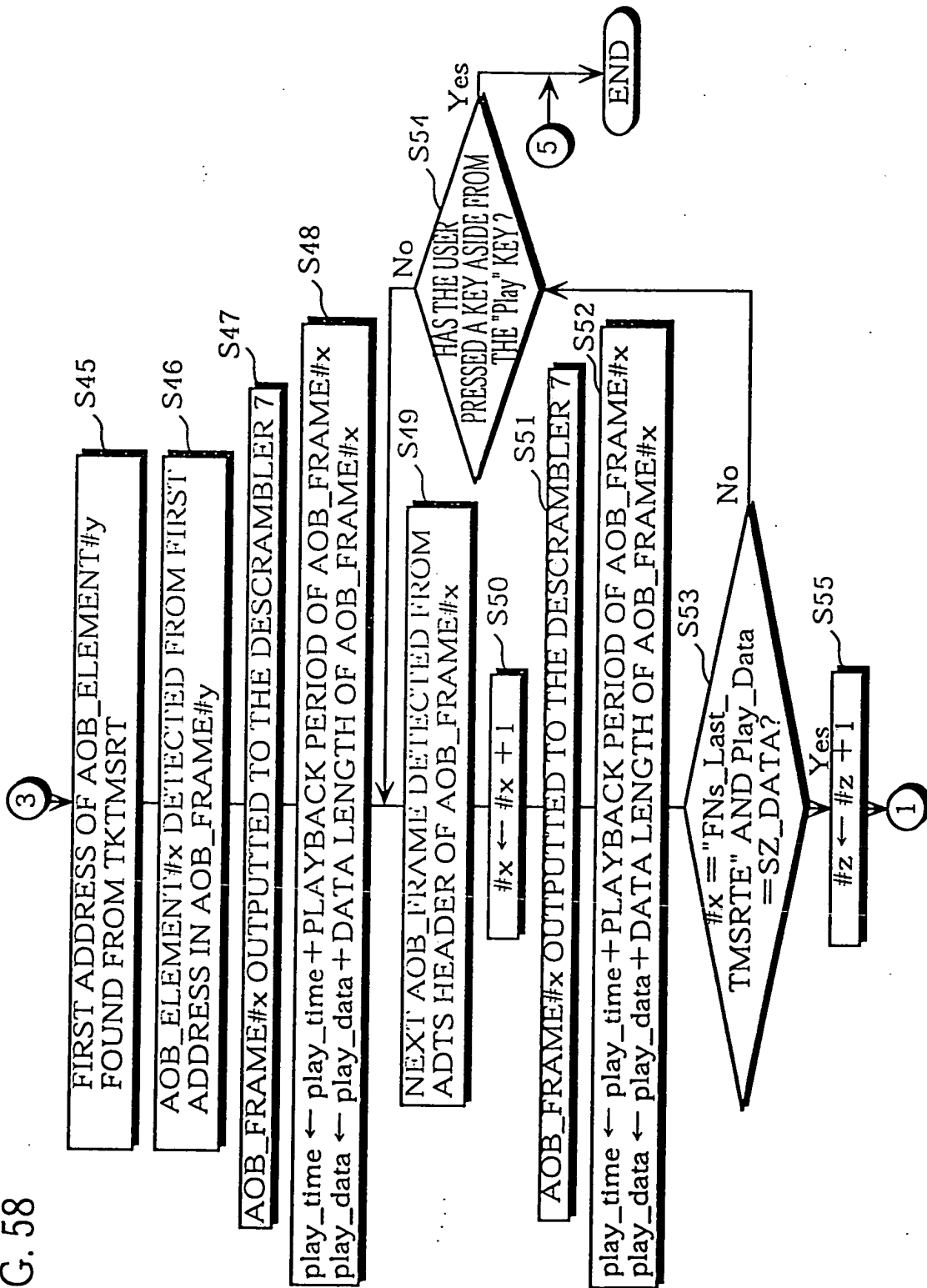
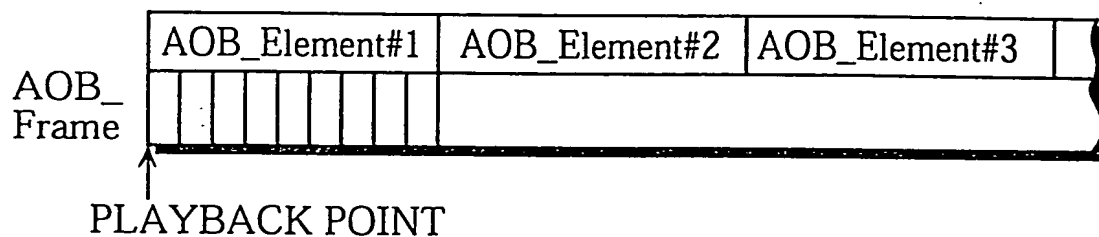
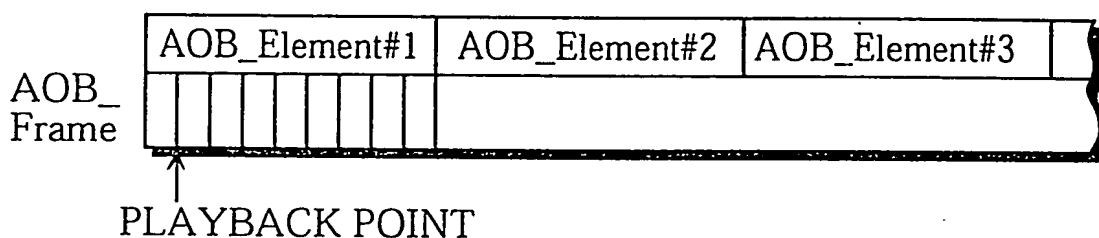


FIG. 59A



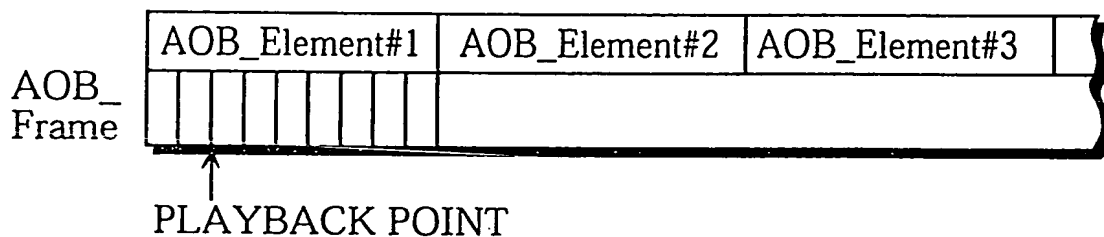
PLAYBACK TIME CODE=00:00:00.000

FIG. 59B



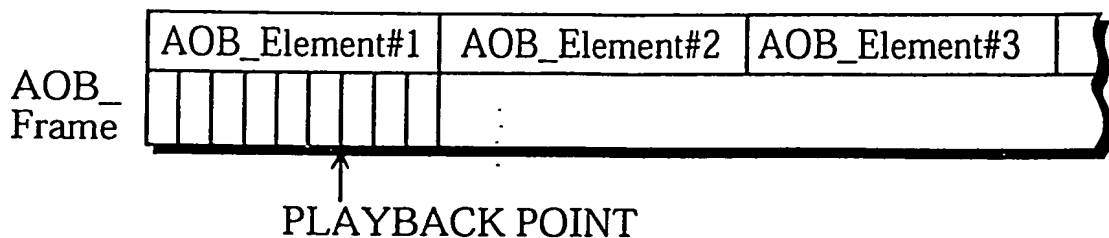
PLAYBACK TIME CODE=00:00:00.020

FIG. 59C



PLAYBACK TIME CODE=00:00:00.040

FIG. 59D



PLAYBACK TIME CODE=00:00:00.120

FIG. 60

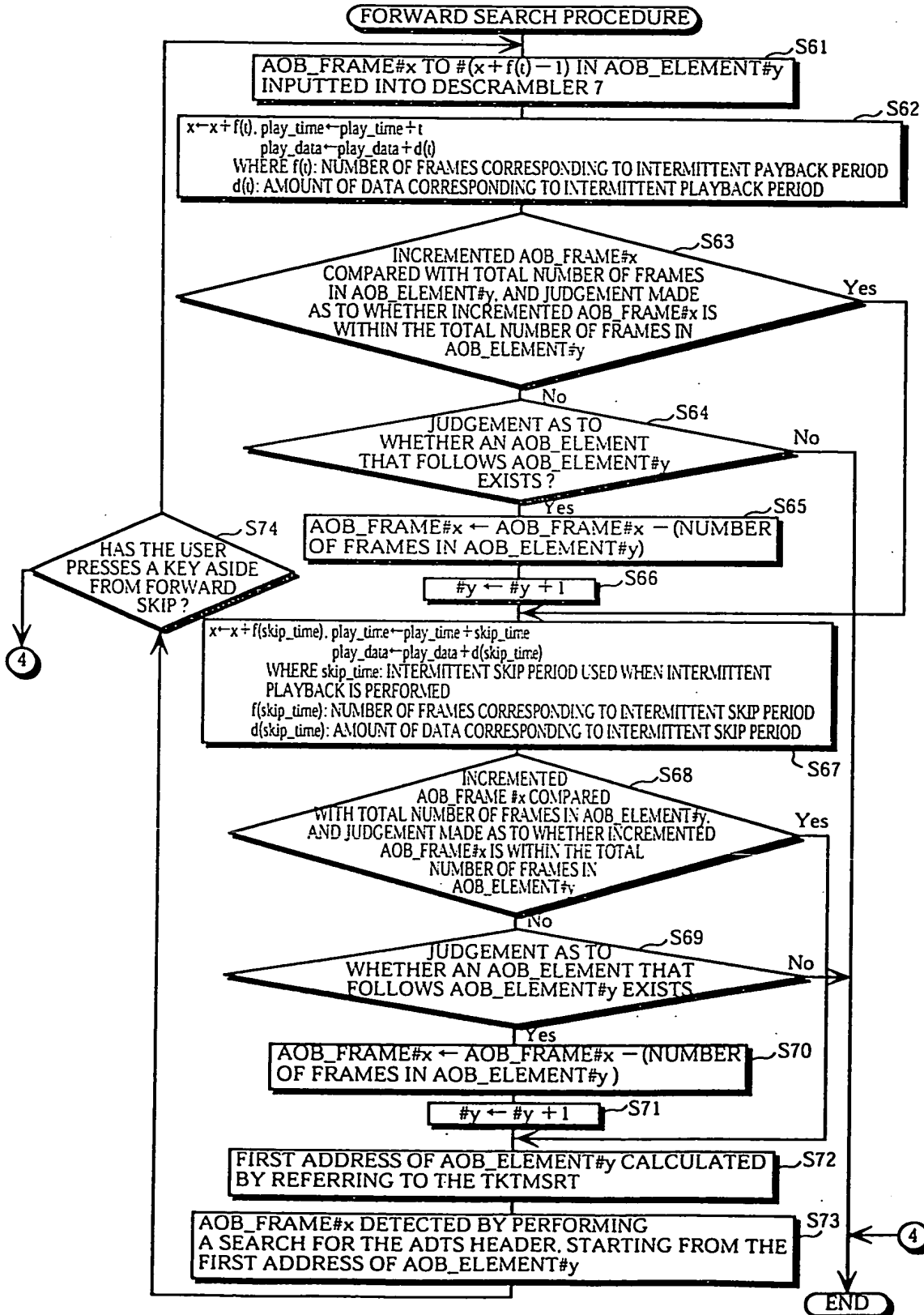


FIG. 61A

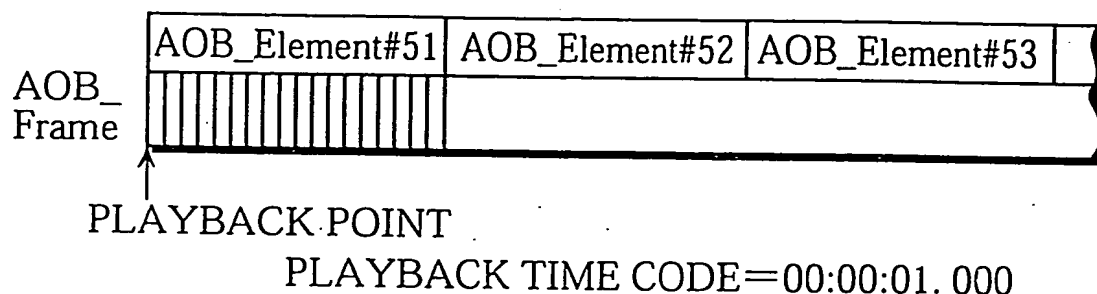


FIG. 61B

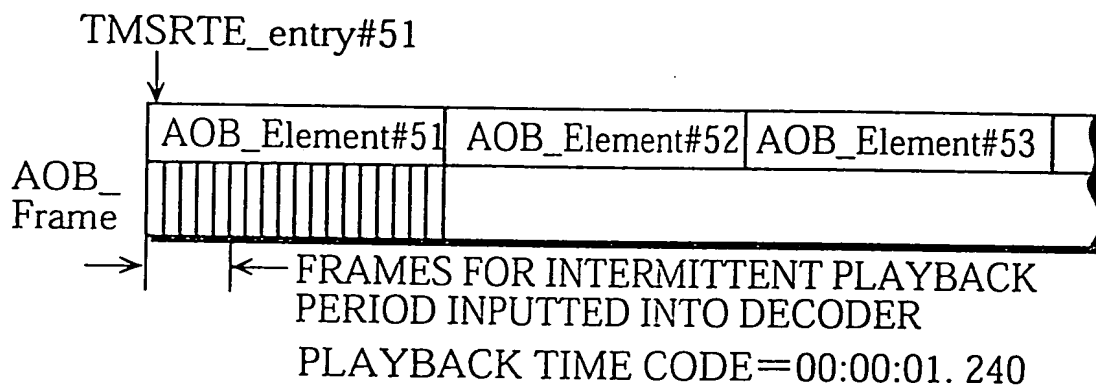


FIG. 61C

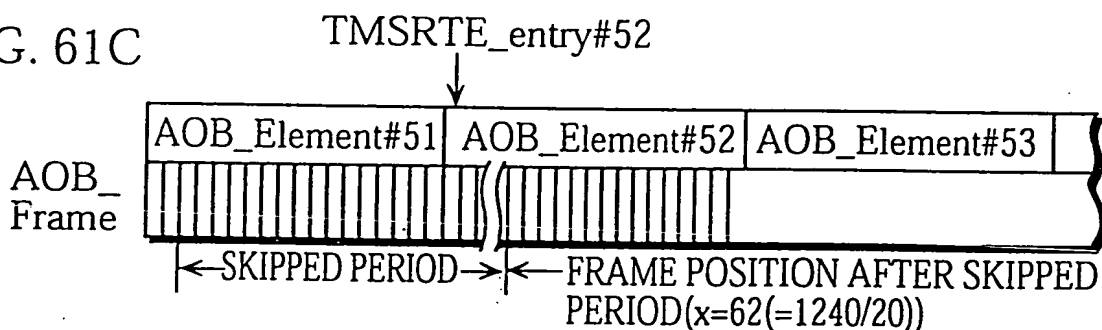
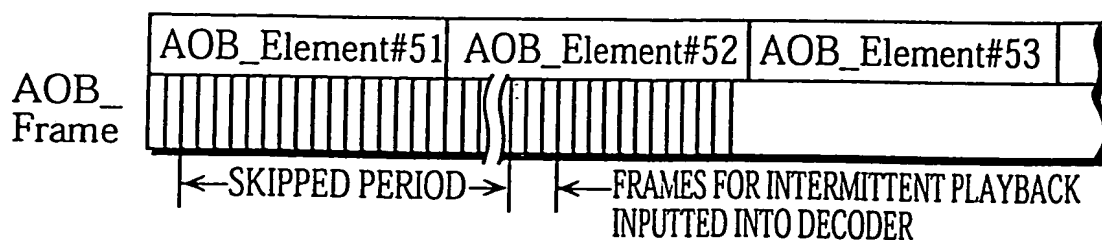


FIG. 61D



PLAYBACK TIME CODE=00:00:03.480

FIG. 62A

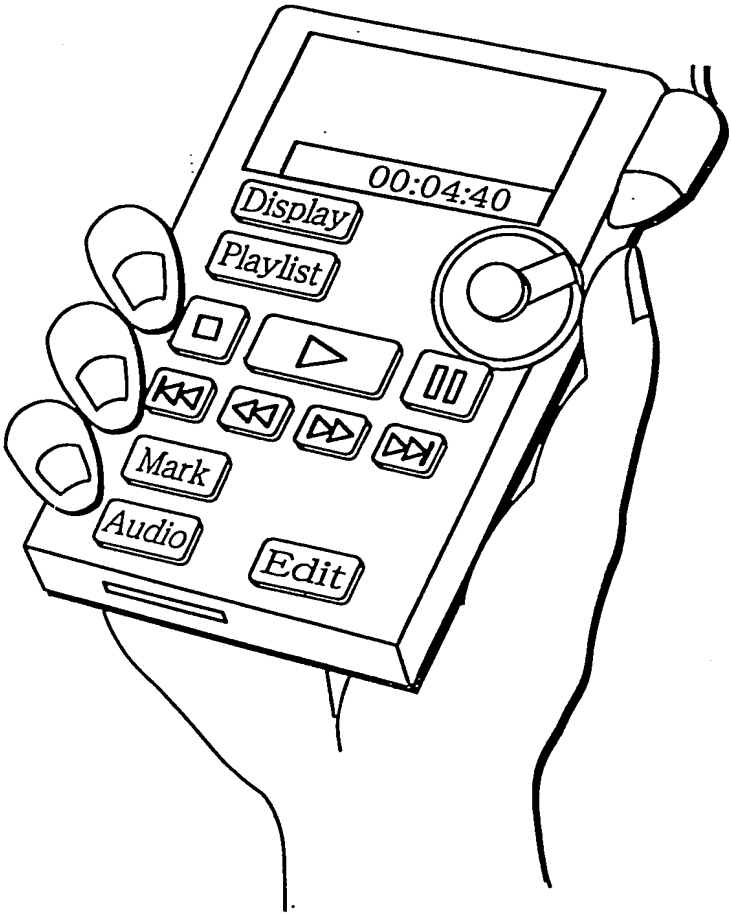
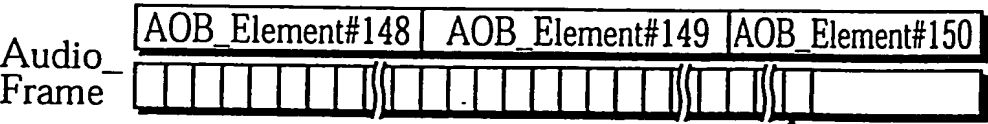


FIG. 62B

BIT	FNs_1st_TMSRTE	80
	FNs_Last_TMSRTE	50
	FNs_Middle_TMSRTE	94



PLAYBACK TIME CODE=00:04:40 (=280sec)  
280sec=(80(=FNs\_1st\_TMSRTE)+148\*94  
(=FNs\_Middle\_TMSRTE)+8\*20msec

↑  
FRAME POSITION  
AT WHICH PLAYBACK  
SHOULD START

FIG. 63

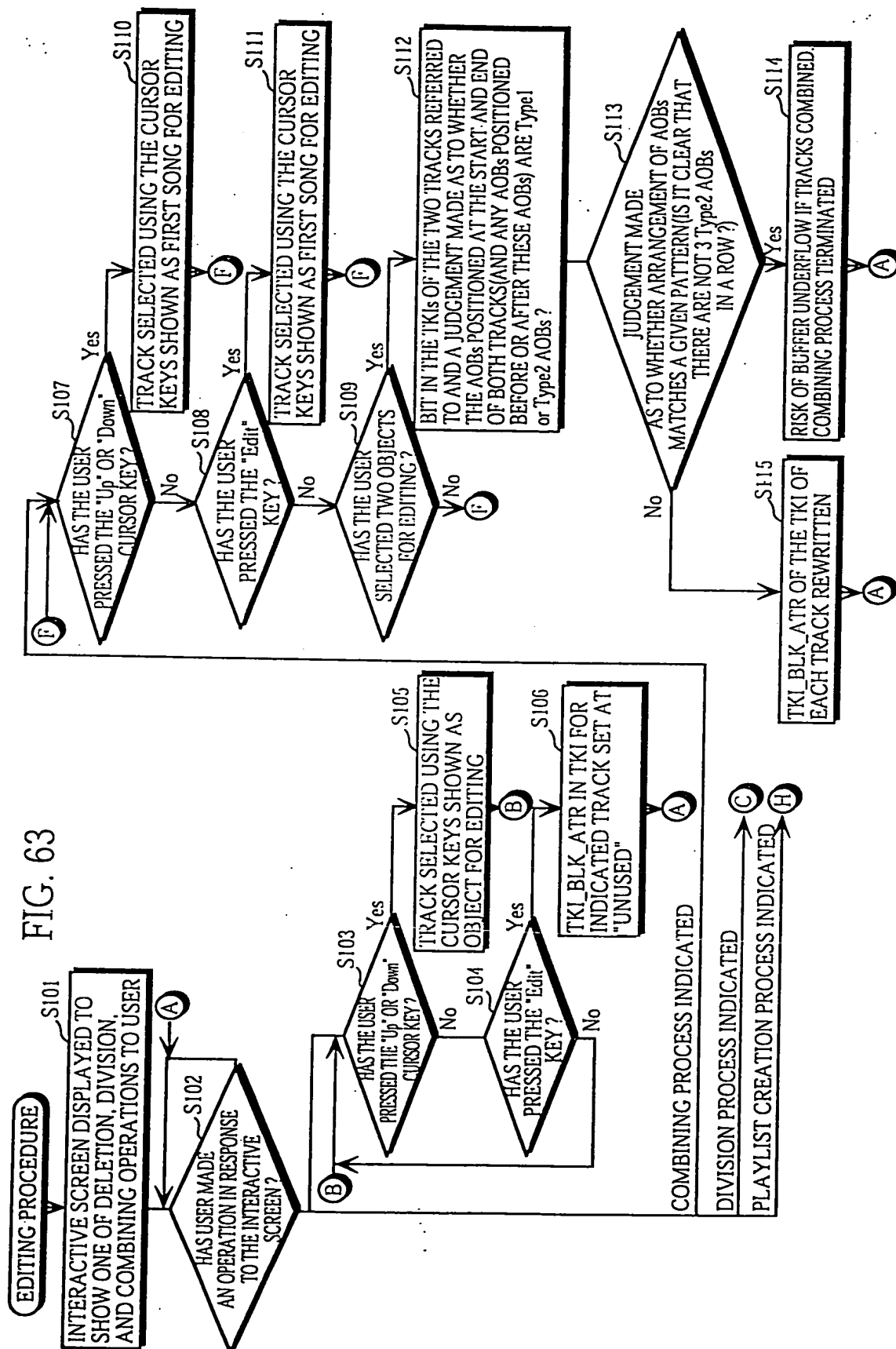


FIG. 64

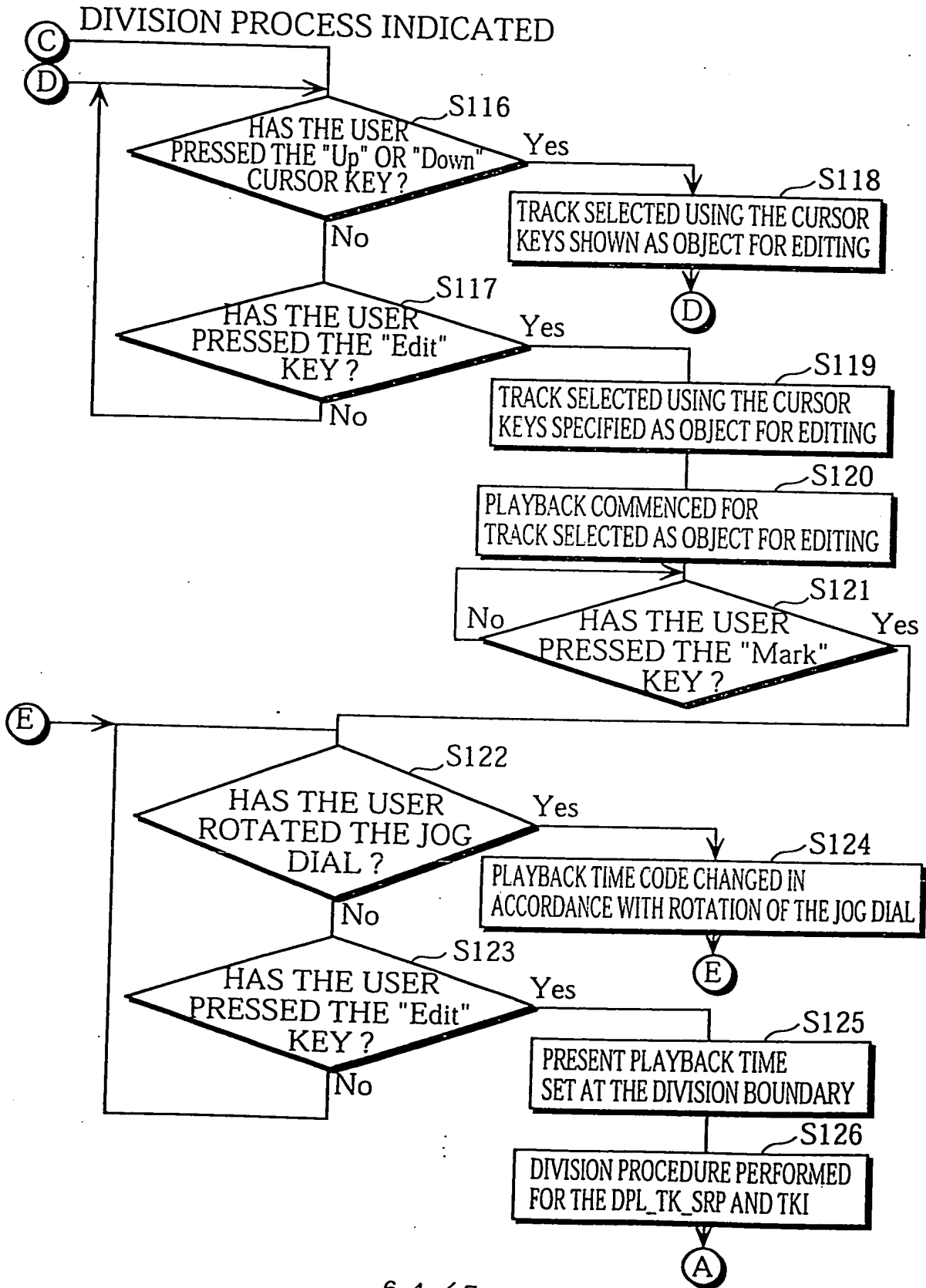
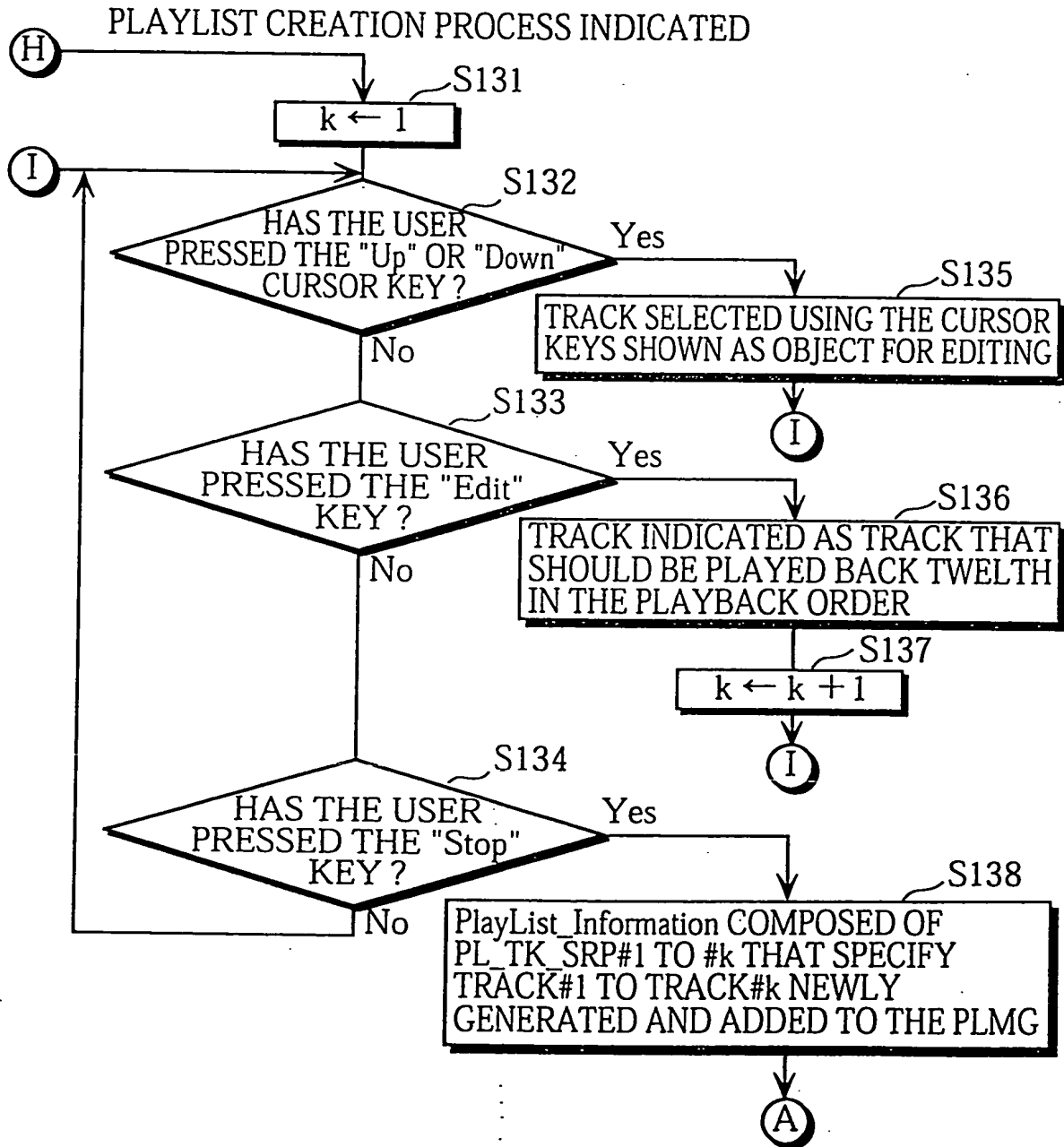




FIG. 65



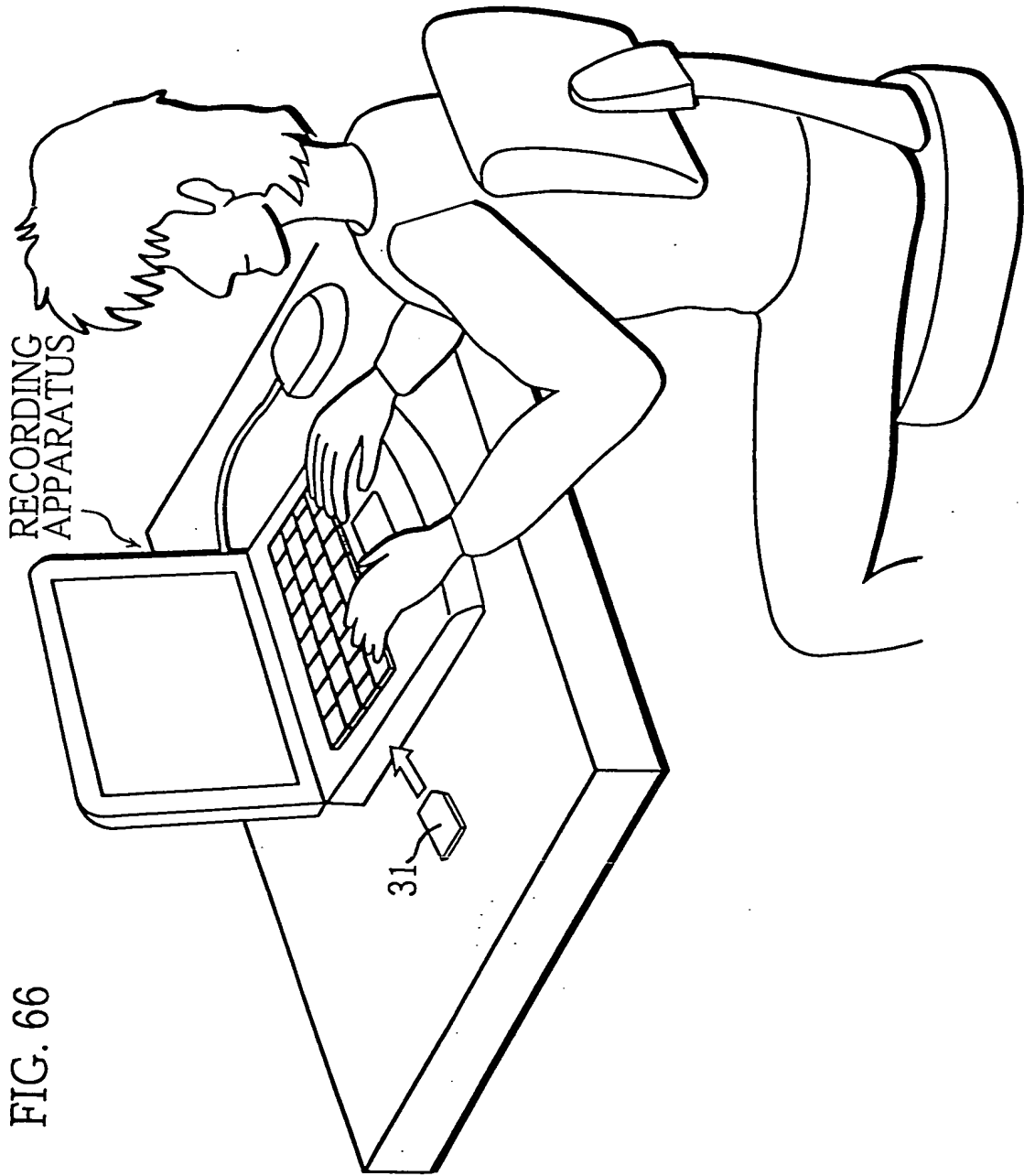


FIG. 66

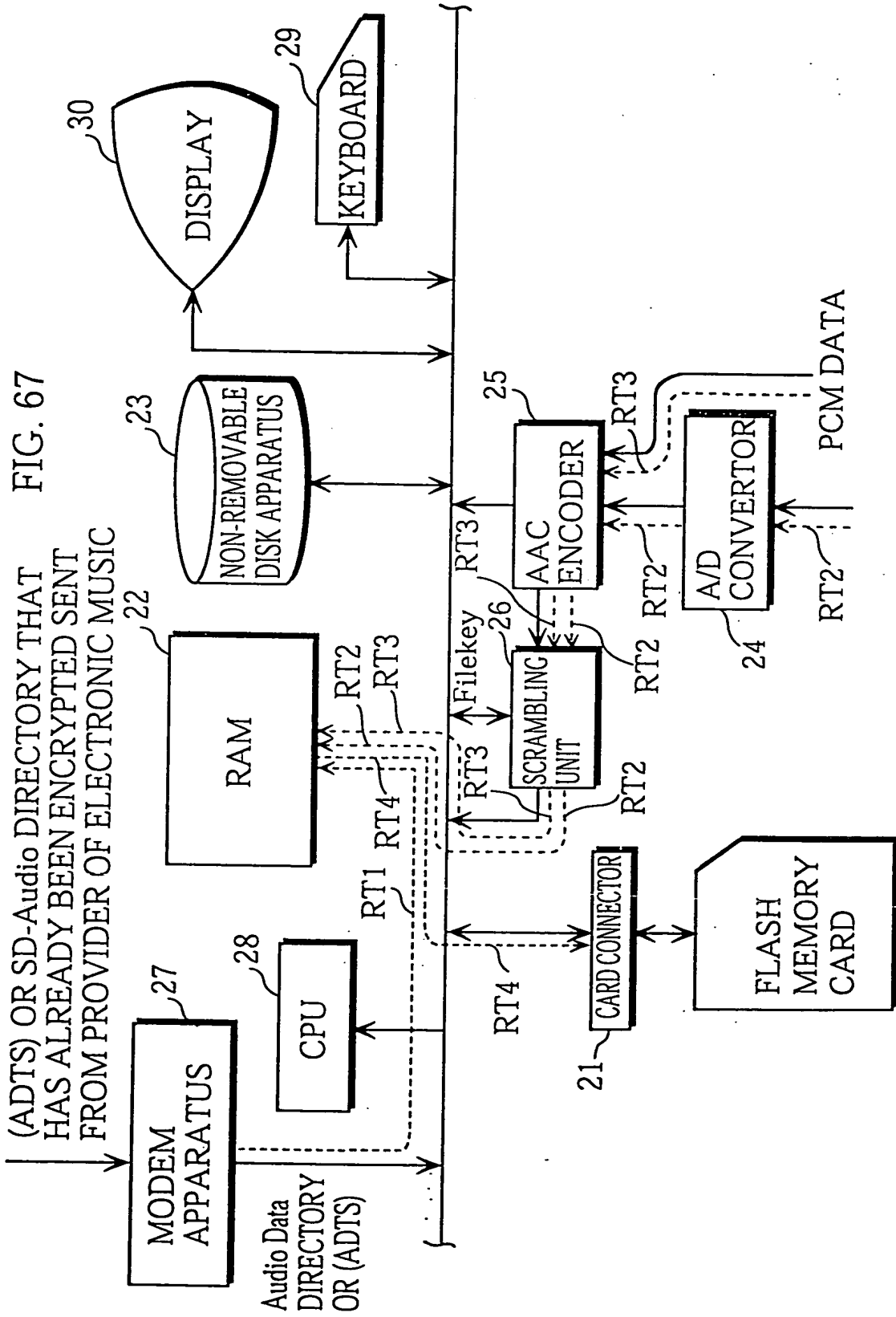
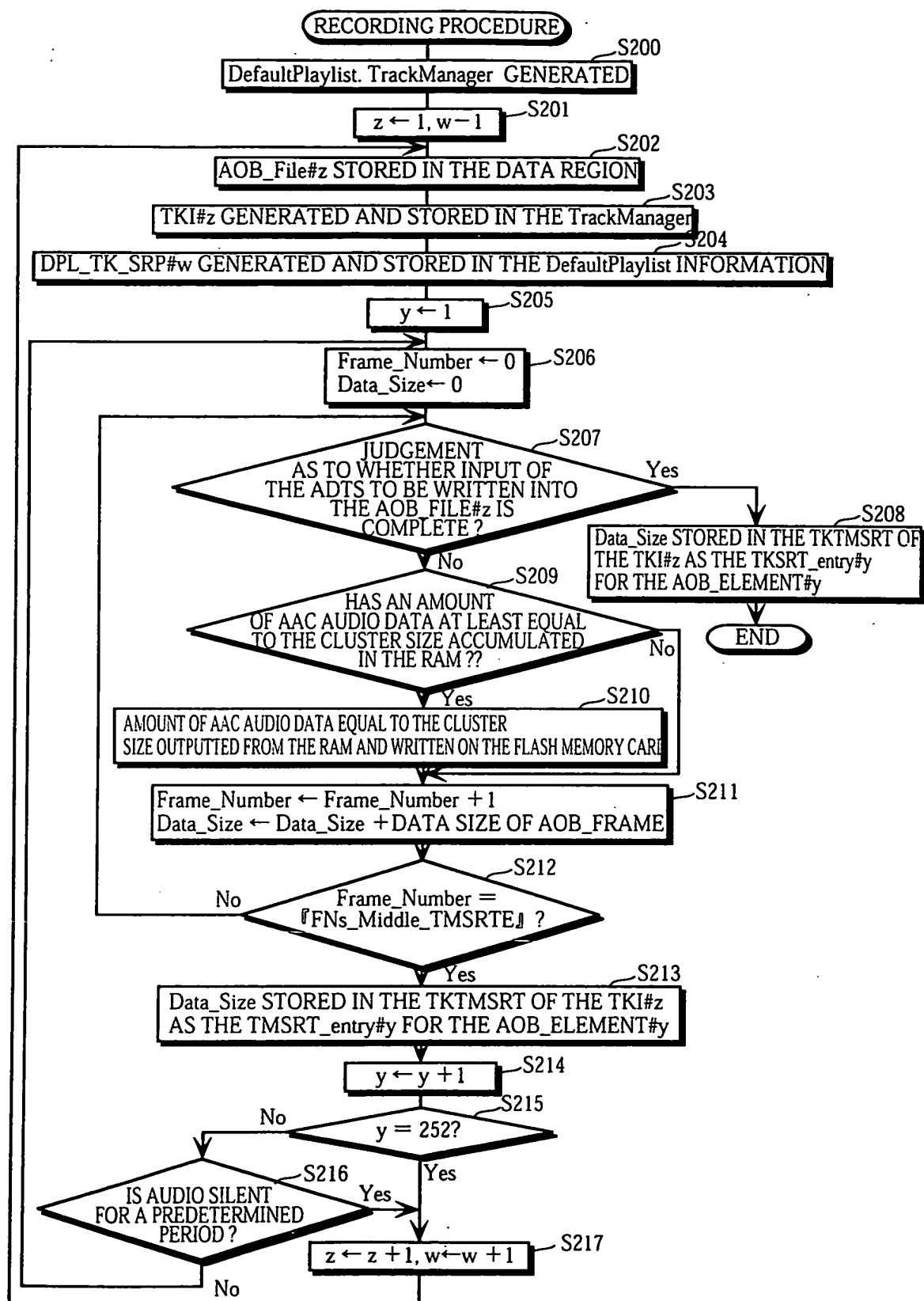


FIG. 68



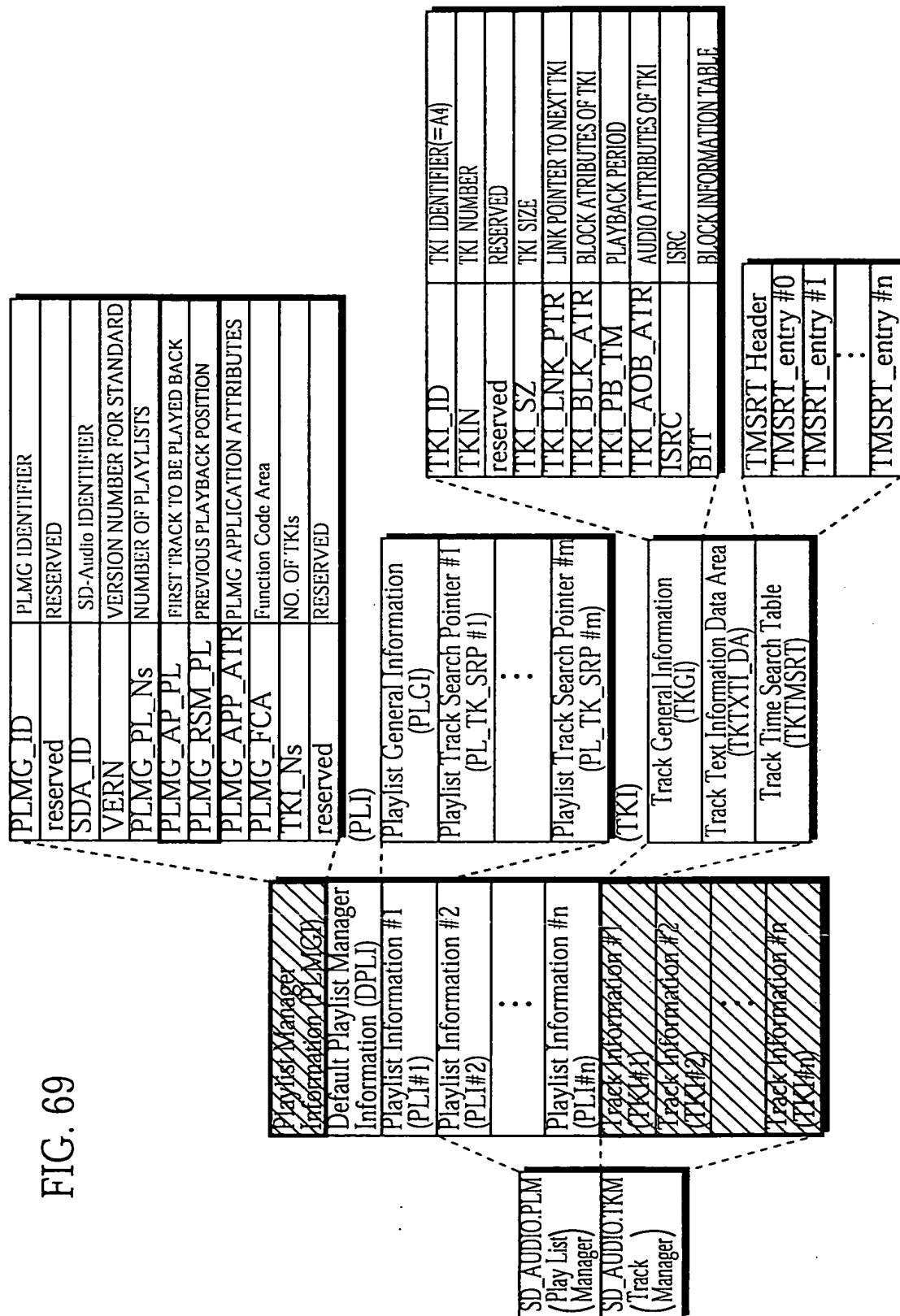
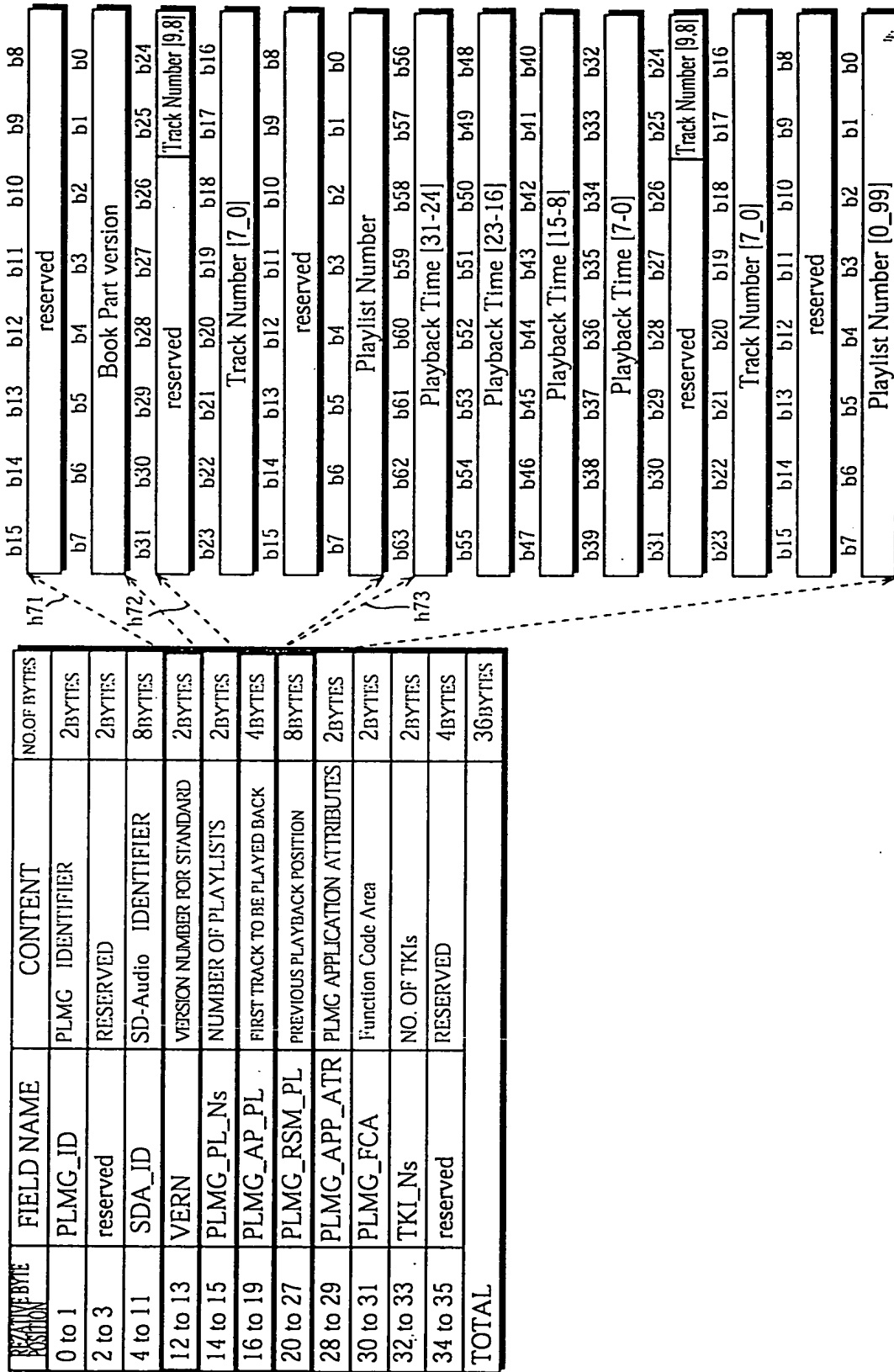


FIG. 70



1000  
 900  
 800  
 700  
 600  
 500  
 400  
 300  
 200  
 100  
 0

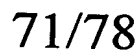


FIG. 72

FIG. 72

PREFERENCES

SELECT TRACK TO BE PLAYED WHEN MEMORY CARD IS LOADED

● RESUME PLAYBACK FROM PREVIOUS POSITION

○ START WITH FAVORITE TRACK

★ FAVORITE TRACK SETTING

Default\_Playlist

Track#3

|<<|>>| ... MOVE CURSOR UP/DOWN

Play ... SELECT



FIG. 73

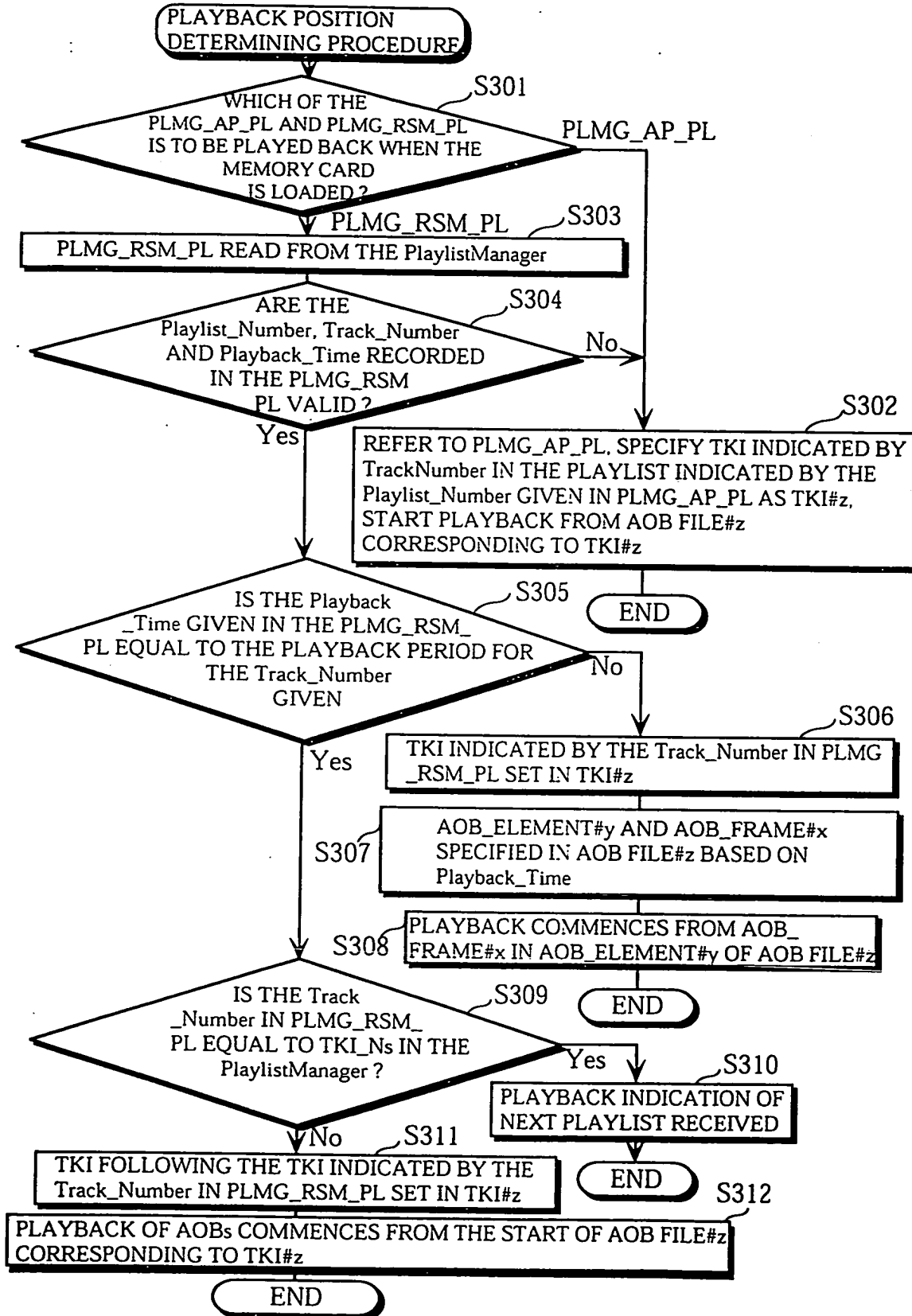


FIG. 74

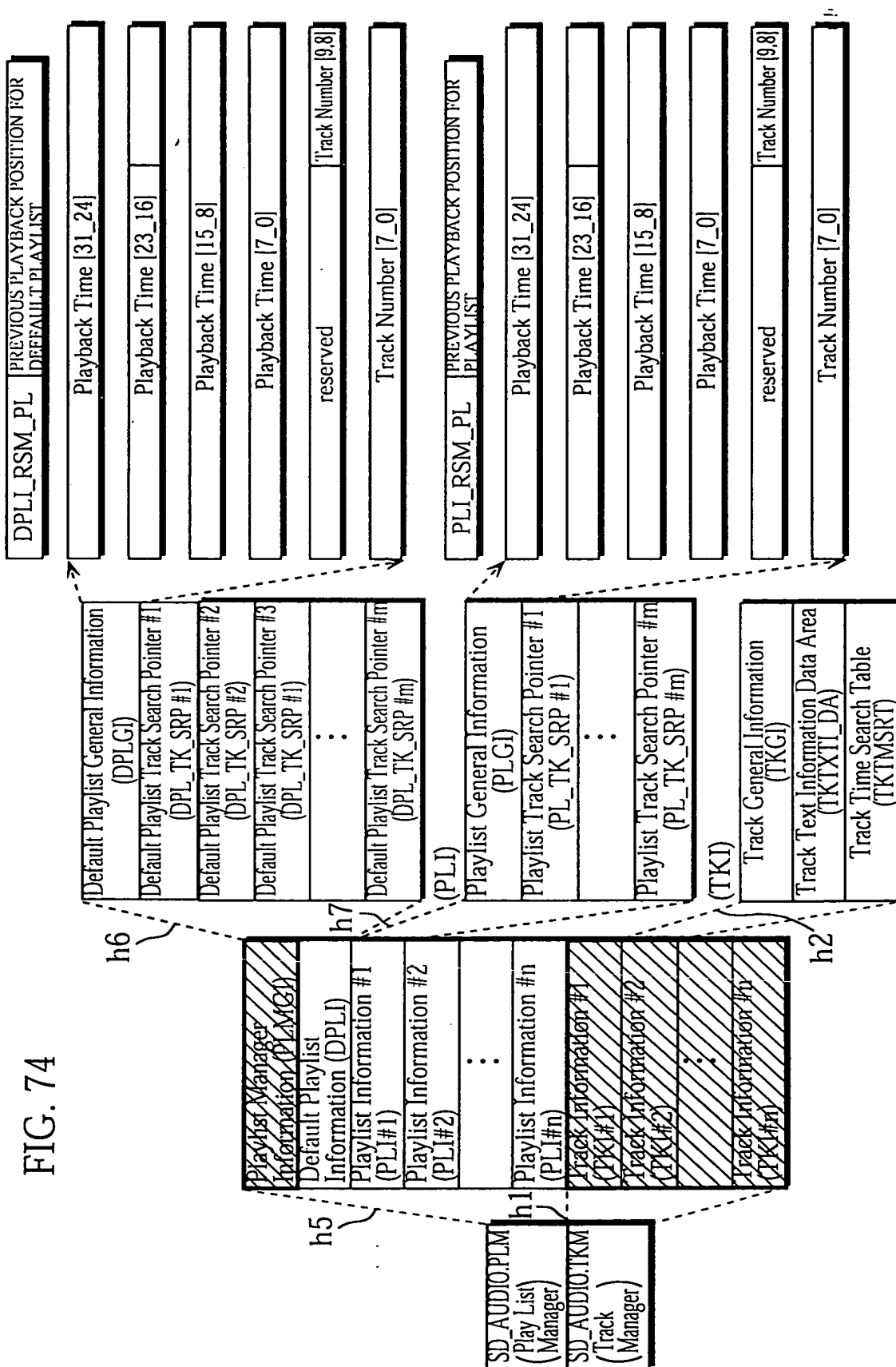


FIG. 75

	Track_ Number	Playback_Time
DefaultPlaylist.DPLGI.DPLI_RSM_PL	TrackC	00:03:31.0000
Playlist#1.PLGI.PLI_RSM_PL	FF	— — —
Playlist#2.PLGI.PLI_RSM_PL	TrackA	00:01:11.0000
Playlist#3.PLGI.PLI_RSM_PL	00	00

FIG. 76

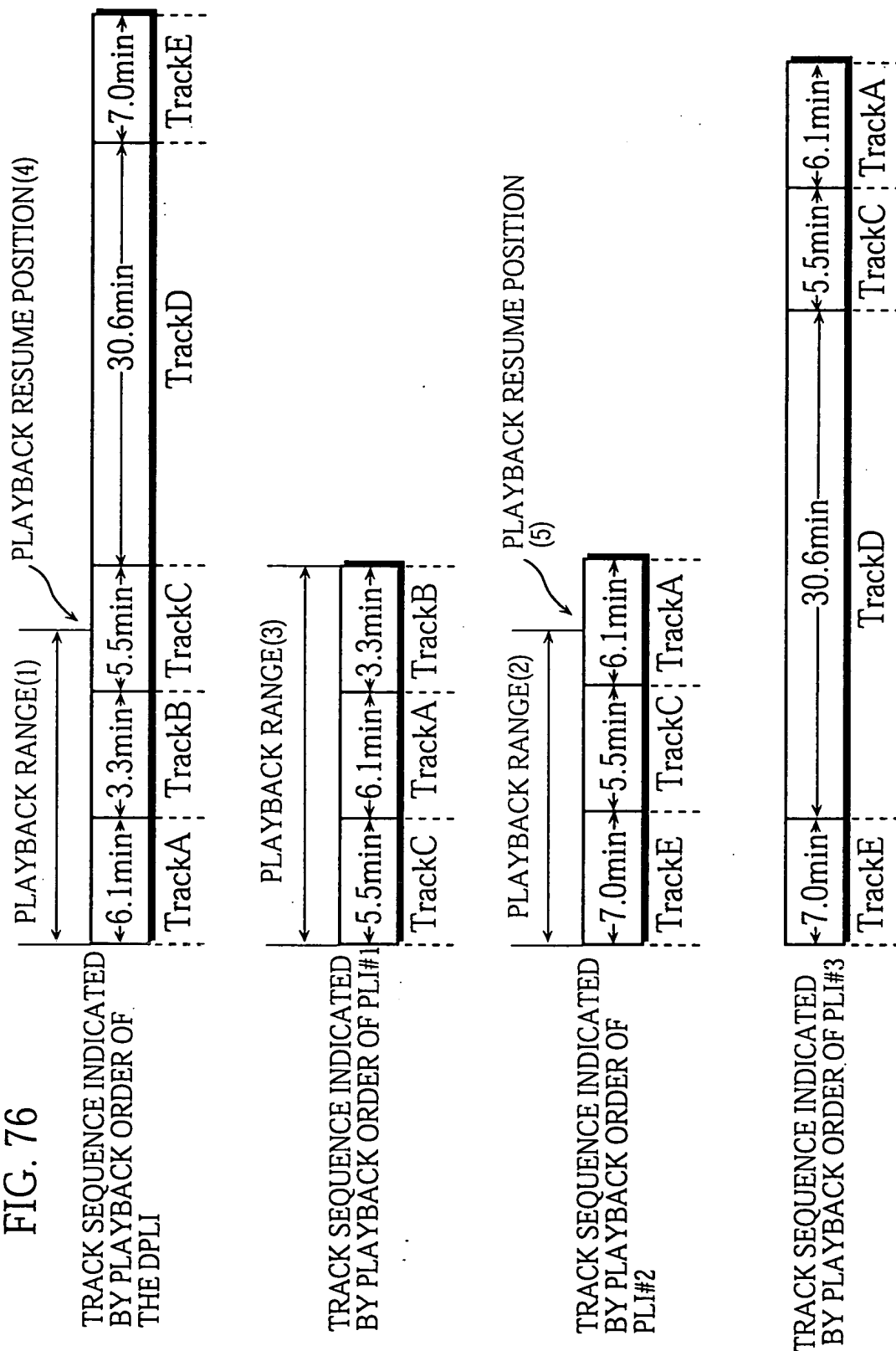


FIG. 77

PLAYLIST SELECTION MENU

SELECT A PLAYLIST FOR PLAYBACK

<u>DefaultPlaylist</u>	<u>TrackC</u>	<u>00:03:31.0000</u>
------------------------	---------------	----------------------

Playlist#1 PLAYBACK COMPLETE

Playlist#2 TrackA 00:01:11.0000

Playlist#3 . . . YET TO BE PLAYED BACK . . .



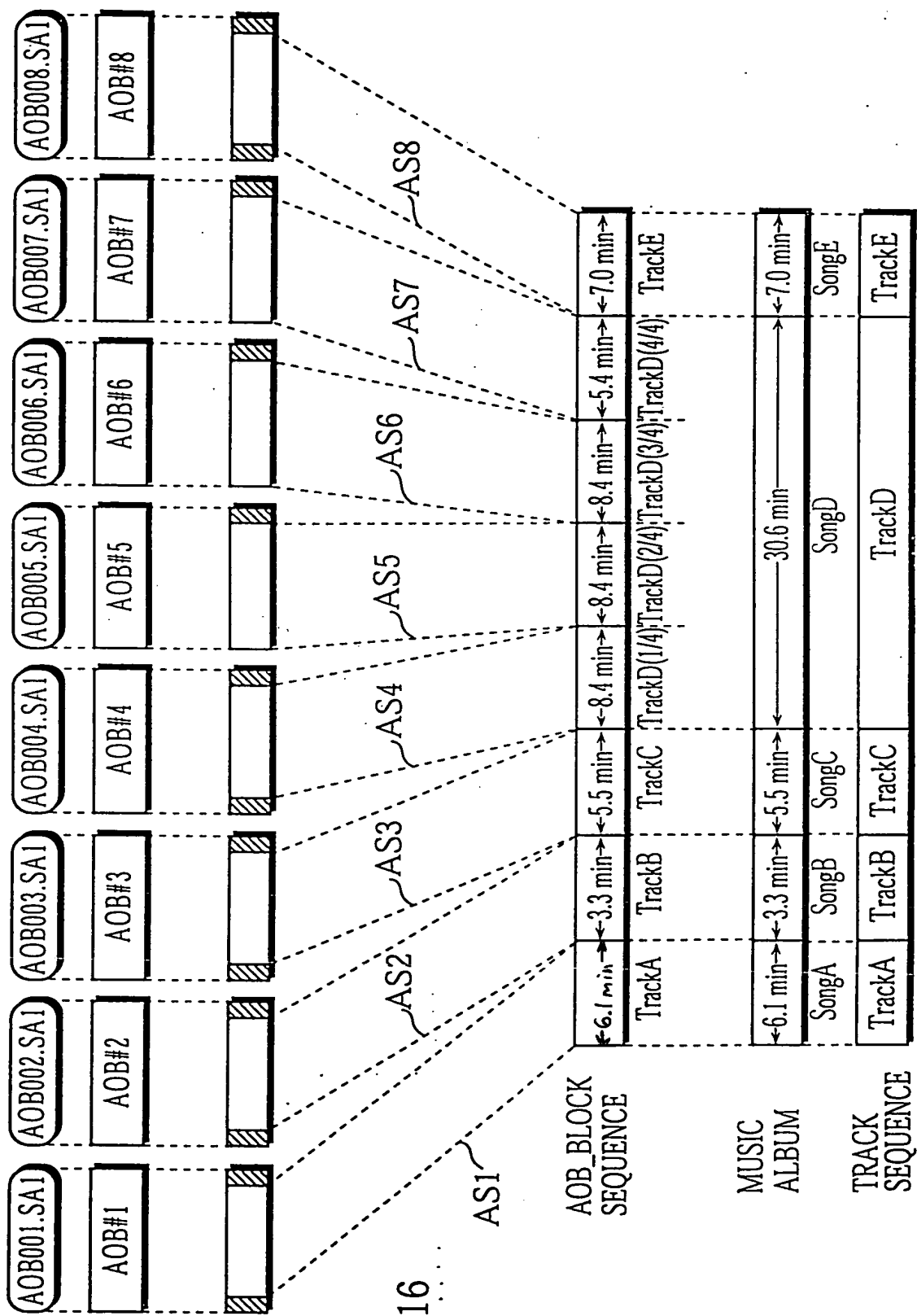


FIG. 16  
16 / 78

FIG. 74

